



Larimer County Transportation Master Plan

July 2017





Larimer County Transportation Master Plan

Prepared for:

Larimer County Public Works

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Adopted by Planning Commission:

August 16, 2017

**RESOLUTION ADOPTING THE 2017 LARIMER COUNTY
TRANSPORTATION MASTER PLAN**

WHEREAS, the 2017 Larimer County Transportation Master Plan has been proposed to supersede and replace the 2006 Larimer County Transportation Master Plan;

WHEREAS, the Transportation Master Plan focuses on the County's existing and future needs for transportation system improvements, including, Roads, Bridges, Bike and Pedestrian, Maintenance, Transit, Freight, and Intersections; and

WHEREAS, future growth in travel demand (e.g. traffic volume), safety, and maintenance demands have been considered; and

WHEREAS, the Transportation Master Plan provides a summary of recommended transportation projects and a prioritization of those projects and forms the foundation for developing future Capital Improvement Programs on an annual basis; and

WHEREAS, public outreach on the Transportation Master Plan was performed via a public survey, an online open house through social media, County email distribution, displays at the Courthouse Offices at 200 W. Oak, two events in the mountain communities that have limited internet connections, and County Commissioner citizen meetings throughout April and May 2017; and

WHEREAS, The Board of County Commissioners has recommended that the plan be adopted;

NOW, THEREFORE, BE IT RESOLVED:

The Larimer County Planning Commission hereby adopts the 2017 Larimer County Transportation Master Plan as an element of the Larimer County Master Plan.

Be it further resolved that the 2017 Transportation Master Plan shall supersede and replace the 2006 Plan.

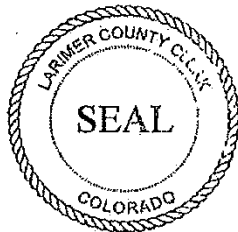
Dated 8/16 as of August 16, 2017.

PLANNING COMMISSION OF
LARIMER COUNTY, COLORADO

By: [Signature]
Chair

ATTEST:

[Signature]



Dated: 7/31/17
Approved as to form:

[Signature]
County Attorney

Please return to Planning



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ACRONYMS AND ABBREVIATIONS

ADT	Average Daily Traffic
BATS	Berthoud Area Transportation Service
CDOT	Colorado Department of Transportation
CIP	Capital Improvement Program
CMAQ	Congestion Mitigation & Air Quality
CNG	Compressed Natural Gas
CO	Carbon Monoxide
COLT	City of Loveland Transit
CR	County Road
CSU	Colorado State University
DAR	Dial-A-Ride
DOT	Department of Transportation
EPA	Environmental Protection Agency
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FO	Functionally Obsolete
FRA	Federal Railroad Administration
FYA	Flashing Yellow Arrow
GMA	Growth Management Area
GWR	Great Western Railway
HUTF	Highway User Trust Fund
HSIP	Highway Safety Improvement Program
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
NAAQS	National Ambient Air Quality Standard
NFRMPO	North Front Range Metropolitan Planning Organization
NO _x	Nitrogen Oxides
PCI	Pavement Condition Index
PID	Public Improvement District
PILT	Payment in Lieu of Taxes
ppm	Parts per Million
RAFT	Rural Alternative for Transportation
RMNP	Rocky Mountain National Park
RTP	Regional Transportation Plan
SAINT	Senior Alternatives in Transportation
SD	Structurally Deficient
SH	State Highway
SIP	State Implementation Plan
STBGP	Surface Transportation Block Grant Program
TA	Transportation Alternatives
UFRTPR	Upper Front Range Transportation Planning Region
UPRR	Union Pacific Railroad
VMT	Vehicle Miles Traveled
VOC	Volatile organic compound
vpd	Vehicles per Day



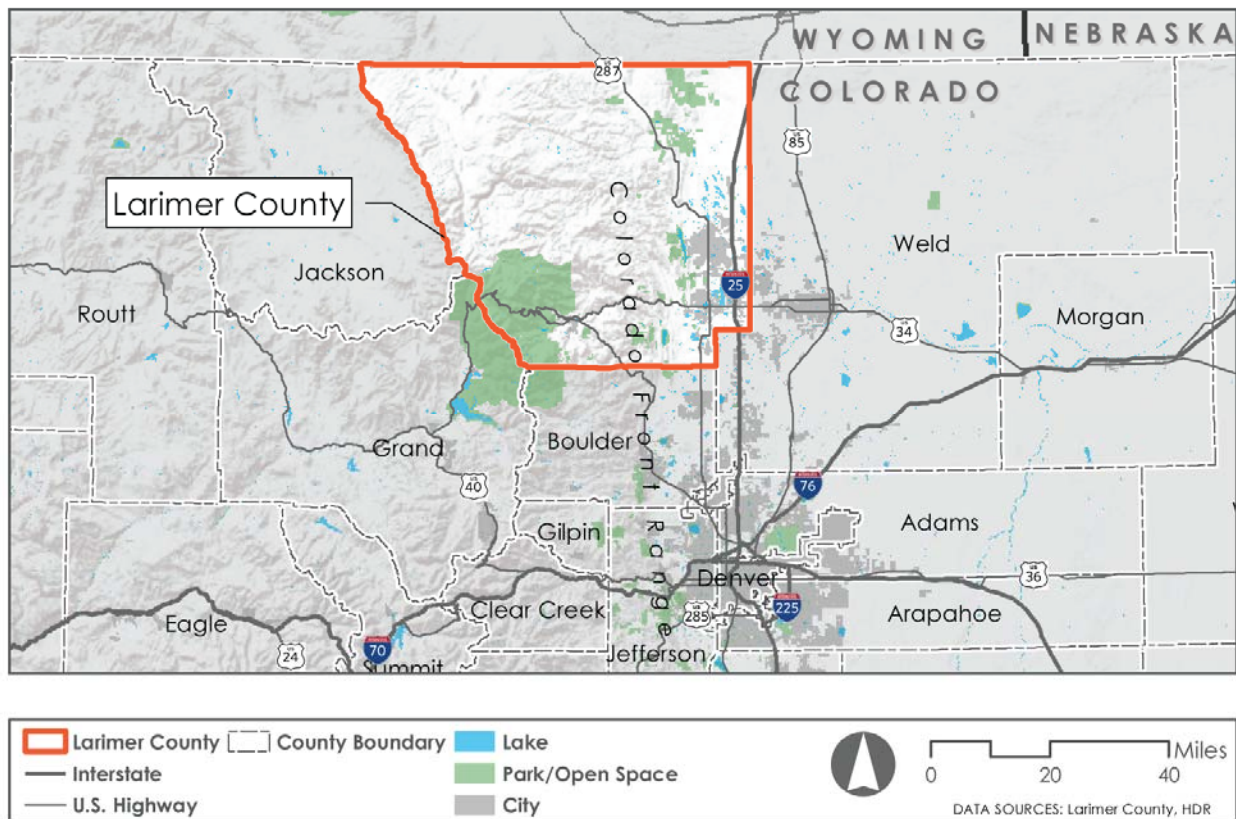
Introduction

Introduction

Larimer County (the County) is located in north central Colorado, sharing borders with Jackson County and Grand County to the west, Boulder County to the south, Weld County to the east, and the State of Wyoming to the north. The County is 2,634 square miles in area, with a growing population of 332,800 as of July 2015. As the sixth-most populous county in the State of Colorado according to the Colorado Demographer’s Office, the County contains the fourth and 14th most populous cities in the State – Fort Collins and Loveland, respectively. The County is mountainous on the west, rural on the eastern plains, and urban in and around its cities. This diverse landscape means the County has a diverse transportation system with wide-ranging maintenance and expansion needs. As Larimer County grows, so do the needs of the transportation system.

Larimer County’s first transportation master plan was developed in 1998 and updated in 2006. The focus of these prior plans was to identify capacity-driven roadway improvements. This *Transportation Master Plan* outlines these needs, as well as focusing on maintenance, alternative modes, and funding needs. It is a step forward for the County in demonstrating its commitment to serve as an engine for economic prosperity.

Figure 1. Larimer County Vicinity Map



Purpose

The purpose of this *Transportation Master Plan* is to provide a comprehensive analysis of the transportation system in Larimer County. This plan is an update to previous plans, but more extensive in nature, identifying short- and long-term funding needs and a list of potential projects for a Capital Improvement Program (CIP).

While roads are the predominant means of transportation, the County is also planning for the expansion and maintenance of other important elements of a fully-integrated transportation network. This *Transportation Master Plan* provides data and information on the existing transportation system in Larimer County, identifies the needs and goals for the system, and examines strategies to address them. It addresses the following transportation network elements in the County:

- Roadway network, including mainline County roads, intersections, and bridges
- Bicycle facilities
- Pedestrian facilities
- Rail network
- Transit systems

Scope of this Plan

Though a wide variety of facility types exist within Larimer County, this *Transportation Master Plan* covers only facilities owned and/or maintained by the County. The County is responsible for the provision and maintenance of publicly-owned transportation infrastructure in unincorporated areas of the County, with the exception of state-owned and federal-owned facilities. The asset responsibility of the County changes when municipalities expand and take over ownership of County infrastructure through an annexation process.

County Roads

Roads in unincorporated Larimer County are all considered County roads, but fall into two categories:

Mainline County Roads. The mainline County roadway system consists of numbered County roads (CR) that operate with odd numbers running north-south and even numbers running east-west. These County roads are further categorized into functional classification based on how they serve the mobility needs of users.

Non-Mainline County Roads. The County roadway network also consists of subdivision roads, County-maintained US Forest Service roads, and roads maintained by Public Improvement Districts (PID). Subdivision roads are publicly dedicated, non-County-maintained roads. The County ensures they are safe but does not maintain them. These roads are owned or maintained by other entities and therefore are not considered mainline County roads.

Throughout this document, any mention of a County road or CR is referring to mainline County roads unless noted otherwise. For reference, other transportation networks within Larimer County, but outside the scope of this study, are described below.

State and US Highway Systems

Within Larimer County, there are interstate highways, US highways, and state highways (SH). Each of these highway facilities falls under the jurisdiction of the Colorado Department of Transportation (CDOT). Though these highways have a large influence on the distribution and flow of traffic, the County is not responsible for the maintenance or management of these facilities.

Interstate Highways. I-25 is the only interstate in Larimer County. It is a divided restricted-access facility with no at-grade crossings or intersections. Interstates provide the most mobility generally serving higher traffic volumes and longer trips.

US and State Highways. US 34, US 36, US 287, SH 1, SH 7, SH 14, SH 56, SH 60, SH 392, and SH 402. This system generally provides longer-distance connectivity across the County and to destinations within the state.

Scenic Byways. There are three federally-designated Scenic Byways in the County, as identified by CDOT. None are completely contained within the County.

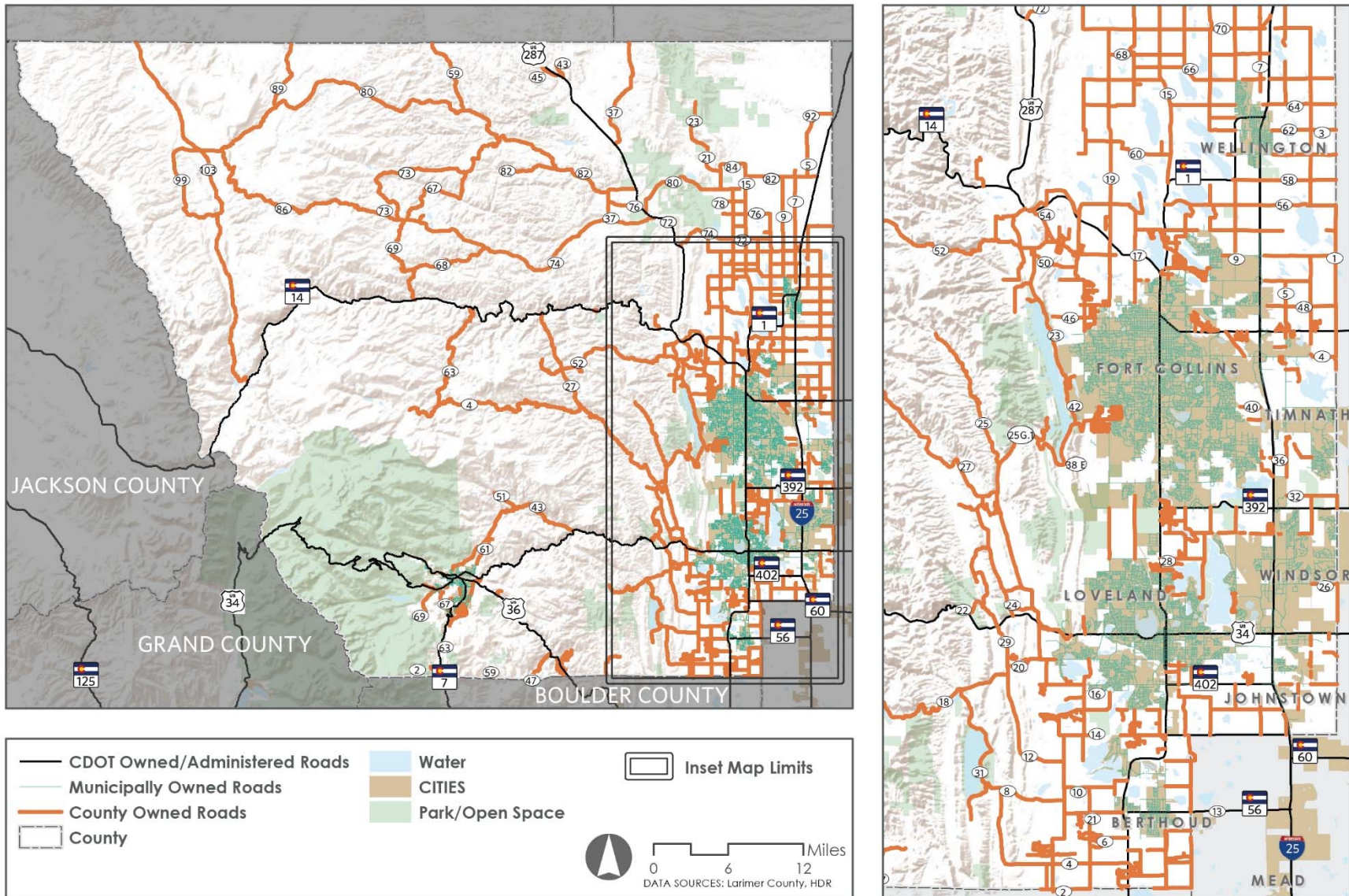
- Cache la Poudre - North Park: SH 14 from I-25 on the east to SH 125 on the west
- Peak to Peak: Peak to Peak Highway from Black Hawk to Estes Park; SH 7 in Larimer County
- Trail Ridge Road - Rocky Mountain National Park (RMNP): US 34 from Estes Park to the Town of Grand Lake

Municipal Transportation Networks

There are two cities (Fort Collins and Loveland) and six towns (Berthoud, Estes Park, Johnstown, Timnath, Wellington, and Windsor) either completely or partially within Larimer County. Each of these municipalities has its own street network owned and maintained by the respective municipality.

Figure 2 shows each of these facility types within Larimer County by ownership.

Figure 2. Roads in Larimer County by Ownership





Plan Context

Plan Context

Planning Process

The development of this *Transportation Master Plan* began in October 2015 with a public outreach effort, and ended in July 2017 with its adoption by the Planning Commission on behalf of Larimer County. The timeline below shows step by step how this plan came to fruition.



Over the course of the plan development, Larimer County staff, consultants, and residents provided input to develop guiding principles, determine existing conditions, and identify recommendations. Larimer County’s Public Works Division, including the Road and Bridge and Engineering Departments, guided this coordinated effort.

This plan incorporates data and information available at the time of its adoption. Note that this plan can and should be updated as new information becomes available, especially concerning the possible omission of roadway segments that were not contained in the County database.

Public Engagement

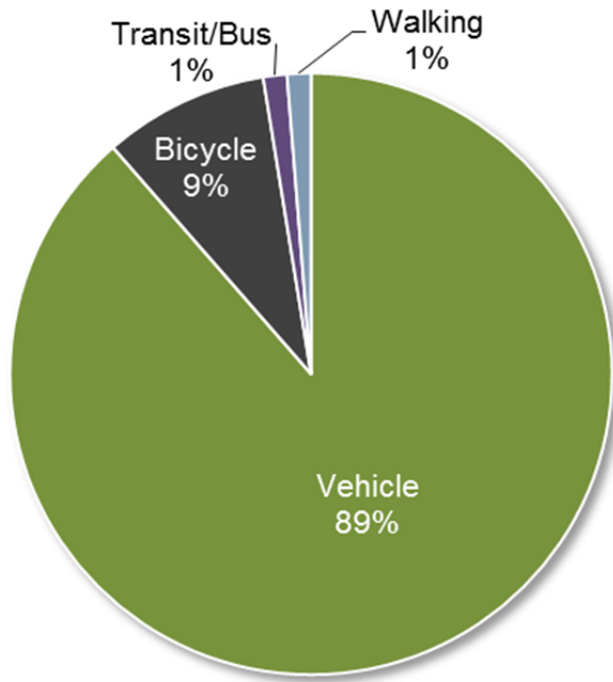
Larimer County Transportation Assessment

The Larimer County Transportation Assessment was an opt-in survey that was made available to County residents from October 20 to November 20, 2015. It was advertised through a variety of media, including Facebook, the Larimer County website, the Coloradoan, and many others. The Larimer County Transportation Assessment generated 1,760 responses. The results are summarized below, and Appendix B contains all 672 comments categorized into bicycle, public transit, road expansion, road maintenance, traffic, and other comments.

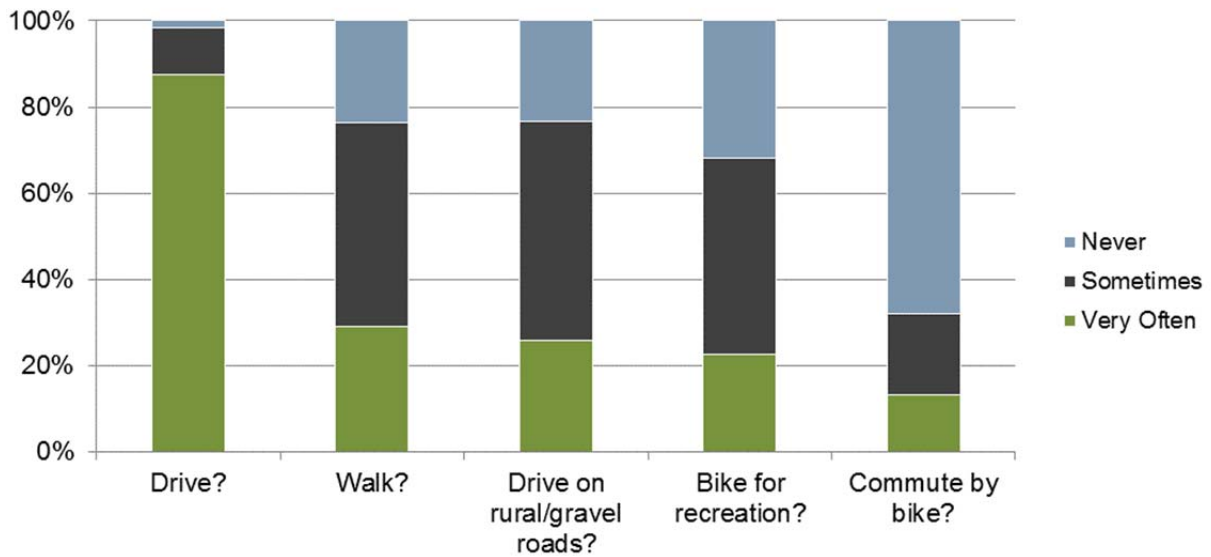
The Larimer County Transportation Assessment indicated that the majority of County residents use a personal vehicle as their primary mode of transportation and regularly drive on rural or gravel roads. While increasing roadway maintenance and expanding roadway capacity were the top transportation improvement priorities for County residents according to this survey, County residents also indicated that they want increased transportation options, including more bicycle lanes, more transit options, and more pedestrian facilities.

What is your primary mode of transportation?

89 percent of respondents use a vehicle (personal, business, or carpool) as their primary mode of transportation.

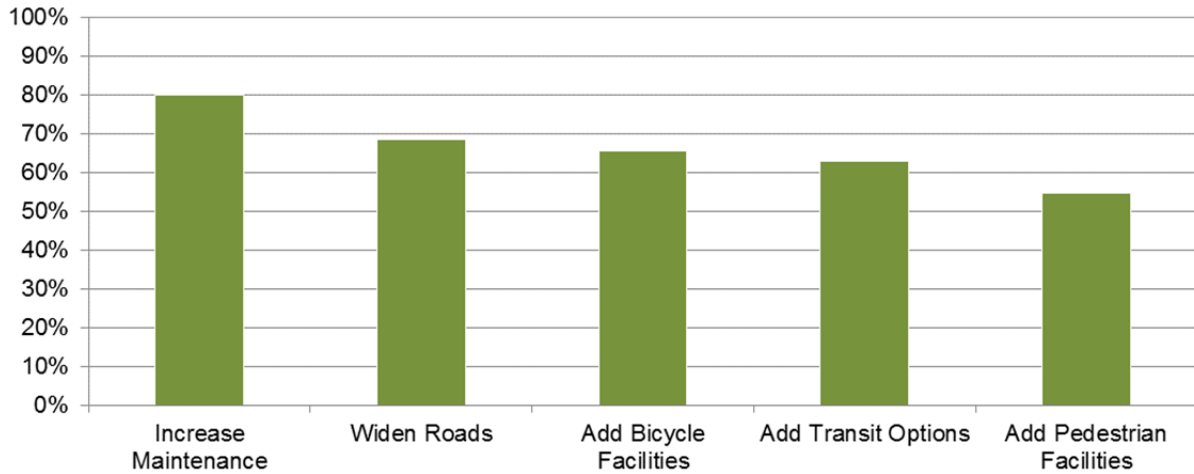


How often do you...



68 percent of respondents said they use a bike for recreation very often or sometimes. 77 percent of respondents drive on rural or gravel roads very often or sometimes.

Which possible transportation improvement would you like to see?



80 percent of respondents said increasing roadway maintenance is an important improvement.

Larimer County Transportation Master Plan Online Open House

The County hosted an online open house from May 15 to June 15, 2017. The purpose of the open house was to gather feedback from the public on the draft findings and recommendations. The open house was publicized through the County’s social media accounts, the County’s website, a County news release, and postcards placed in several County buildings.

The online open house was hosted on a project-specific website. Here, attendees were able to review countywide existing conditions, identified needs, and recommended improvements. The online open house also included story maps, where attendees could leave geographically-coded comments.

Additionally, County staff attended the following events to answer questions and distribute fact sheets and comment forms:

- Big Thompson Canyon Pancake Breakfast on Saturday, June 4, 2017.
- Glacier View Wildfire Community Preparedness Day on Saturday, June 10, 2017.

At the Big Thompson Canyon Pancake Breakfast, County staff heard that residents were most concerned with US 34, which falls under CDOT’s jurisdiction. Residents would also like to see predetermined emergency routes established prior to disasters.

At the Glacier View Wildfire Community Preparedness Day, residents voiced concerns over the level of maintenance on non-paved roads. County staff heard that residents would like to see more maintenance, especially on roads near the fire departments.

County staff also attended seven citizen meetings and one work session with the Board of County Commissioners.

Mail-in comment forms and USB drives containing the plan were made available at the following locations to accommodate mountain areas with limited or no internet access:

- Red Feather Lakes Community Library
- Glen Echo Resort
- The Mishawaka
- Glen Haven General Store
- Masonville Post Office
- The Forks

In addition to the verbal comments described above, these efforts generated a total of 13 written or online comments. Nine came from the online public meeting, three from the Glacier View Wildfire Community Preparedness Day, and one from a mail-in comment form.

Eight of the 13 comments involved CR 80C, largely noting the need for more maintenance. Commenters stated that the poor maintenance on CR 80C increases the fire department's response time and damages vehicles. Others stated that CR 80C needs safety improvements.

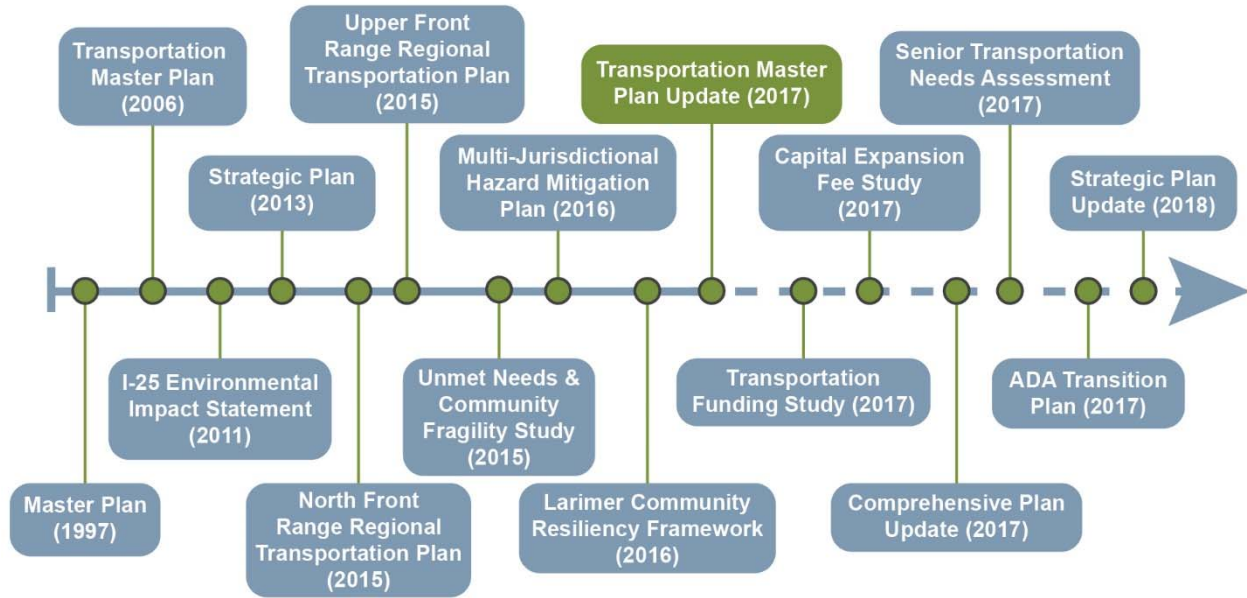
The remaining comments are summarized below:

- Glade Road needs bicycle paths.
- Shields Road needs improved bicycle safety.
- Owl Canyon Road needs to be paved.
- Owl Canyon Road needs more enforcement on non-paved sections to decrease the number of large trucks speeding down the canyon.
- Boy Scout Road between CR 74E and SH 14 needs more maintenance and more gravel.

Similar to the Larimer County Transportation Assessment, this public outreach effort indicated that County residents desire a greater level of maintenance on non-paved roadways.

Related Plans

This *Transportation Master Plan* was informed by prior planning studies and was developed in coordination with concurrent studies. The timeline of past, current, and future planning efforts is illustrated below.



Coordination with Concurrent Planning Efforts

This plan informs the following ongoing or upcoming Larimer County plans:

- Strategic Plan Update
- Transportation Funding Study
- Comprehensive Plan
- ADA Transition Plan
- Senior Transportation Needs Assessment

Prior Planning Efforts

Prior planning efforts informed the development of this *Transportation Master Plan* and are summarized below.

Larimer County Master Plan

The *Larimer County Master Plan* was adopted in 1997 and remains in force during the development of this *Transportation Master Plan*. Following are the guiding principles contained in the Transportation section of the *Larimer County Master Plan*. Strategies for implementing these principles can be found in Appendix C.

- TR-1: The Larimer County transportation planning process shall complement the development patterns and principles of the Master Plan.
- TR-2: New development shall occur only where existing transportation facilities are adequate or where necessary improvements will be made as part of the development project.
- TR-3: New development shall pay its equitable share for necessary improvements to the County transportation system.
- TR-4: Larimer County shall encourage the development and use of alternative modes of transportation.
- TR-5: Larimer County shall establish a Capital Improvement Program for County transportation facilities.

The County is currently developing a Comprehensive Plan, which will serve as an update to the Master Plan.

Larimer County Strategic Plan

The *Larimer County Strategic Plan (2013-2018)* was developed as a part of the County's "Planning our Future" process involving citizens, community leaders, the Board of County Commissioners, elected officials, and employees. The results of these efforts are a vision for Larimer County, a set of high-level goals that County government aspires to, and a series of objectives to drive action over a five-year period.

Transportation is one of the four focus areas. The Strategic Plan's goal for transportation is to "have an efficient transportation system and road network with safe and well-maintained roads and alternative modes of transportation." The transportation objectives for this goal were revised in 2015 as listed below. These objectives are discussed within the relevant sections of this plan.

Short-Term Strategic Objectives

- By the end of 2020, 100 percent of the publicly owned and maintained bridges, on mainline collector or arterial roads over 200 Average Daily Traffic (ADT), in unincorporated Larimer County will be structurally sufficient.
- By July of 2017, an evaluation of the transportation needs and challenges for seniors living in unincorporated Larimer County will be completed. Existing and new options for addressing those needs and challenges will be identified, prioritized, and implemented.
- By the end of 2016, a prioritized list of transportation needs in unincorporated Larimer County will be completed, and the gap between existing funding and the cost of those prioritized needs will be identified. By the middle of 2017, options to close the gap in transportation funding will be identified.
- By the end of 2016 a coalition in Larimer County will be established to promote the use of compressed natural gas (CNG). The coalition, led by Larimer County, will create a Countywide plan that will identify the CNG fueling sites and fleet conversions.
- By the end of 2018, two (2) publicly accessible fueling sites will be operational in Larimer County, and 100 public agency fleet vehicles will be converted to CNG.

North Front Range 2040 Regional Transportation Plan

The North Front Range Metropolitan Planning Organization (NFRMPO) is responsible for creating a Regional Transportation Plan (RTP), that covers the urbanized portion of Larimer County, to provide CDOT with local input on regionally significant corridors. The 2040 RTP, developed in 2015, includes corridors on CDOT-maintained roads, as well as roads within the jurisdiction of Larimer County and municipalities. Table 1 identifies these corridor locations from this planning effort. Increasing mobility is the primary investment need on all of these regionally significant corridors, with the exception of one location identified in Table 1.

The full project descriptions can be found in the online RTP at <http://nfrmpo.org/rtp/>.

Table 1. North Front Range Regional Transportation Plan Regionally Significant Roadway Corridors

Primary Corridor	Boundaries
I-25	Larimer CR 56 to Weld CR 38
US 34	Eastern NFRMPO boundary to western NFRMPO boundary
US 287	Northern NFRMPO boundary to southern NFRMPO boundary
SH 1*	US 287 to Larimer CR 56
SH 14	US 287 to eastern NFRMPO boundary (approx. Larimer CR 3)
SH 56	Larimer CR 17 to Weld CR 17
SH 60	Larimer CR 17 to Two Rivers Parkway
SH 392	US 287 to eastern NFRMPO boundary
SH 402	Larimer CR 17 to US 85
Larimer CR 3	Crossroads Boulevard to southern NFRMPO boundary
Larimer CR 5	SH 14 to US 34
Larimer CR 17	US 287 to SH 56
Larimer CR 19	US 287 to US 34
Weld CR 13	SH 14 to southern NFRMPO boundary
Crossroads Boulevard	I-25 to US 85
Harmony Road	Larimer CR 17 to Weld CR 21
Mulberry Street	Larimer CR 19 to Riverside Avenue
Prospect Road	Larimer CR 5 to US 287
Timberline Road	Vine Drive to southern NFRMPO boundary

*identified for a safety improvement instead of a mobility improvement

Upper Front Range 2040 Regional Transportation Plan

The Upper Front Range Transportation Planning Region (UFRTPR) encompasses the rural parts of Larimer and Weld Counties, outside of the NFRMPO boundary, and all of Morgan County. The UFRTPR creates a RTP every five years to assist CDOT with their planning and decision-making for the region. The 2040 RTP, developed in 2015, identifies 10 projects in Larimer County, shown in Table 2.

The RTP can be found online at [http://coloradotransportationmatters.com/wp-content/uploads/2015/05/UFR RTP FINAL v3 eView-5-22-2015.pdf](http://coloradotransportationmatters.com/wp-content/uploads/2015/05/UFR_RTP_FINAL_v3_eView-5-22-2015.pdf).

Table 2. Upper Front Range Regional Transportation Plan Projects

Priority	Primary Corridor	Location	Project Description
3	US 287	Ted's Place to Wyoming border	Passing lanes and other safety improvements
6	US 36	Estes Park to Boulder County line	Major widening, passing lanes, and pullouts
6	US 287	SH 14 - Ted's Place	Intersection improvements
8	US 287	Larimer CR 72 (Owl Canyon Road)	Intersection improvements
10	SH 14	US 287 to Larimer County line	Passing lane and geometric improvements
12	US 34	US 36 intersection in Estes Park	Major widening, safety, traffic operations, and transportation systems management
14	US 287	Larimer CR 80C (West)	Intersection improvements (northbound left)
15	US 34	Estes Park	Safety and system preservation improvements in Estes Park
20	SH 1	Larimer CR 9 - Meyers Corner	Intersection improvements
20	SH 1	Douglas Road	Intersection improvements (signal and auxiliary lanes)

Air Quality Planning

Larimer County has two pollutants that are monitored for air quality and reported to the US Environmental Protect Agency (EPA). The National Ambient Air Quality Standard (NAAQS) sets the standard for emissions and requires the lead planning agency in the state (Colorado Department of Public Health & Environment in Colorado), as defined by the governor, to perform tests and report on the results. The two pollutants are ozone, with Volatile Organic Compounds (VOC) and Nitrogen Oxides (NO_x) as the precursor, and carbon monoxide (CO). Both of these pollutants have specific mobile source control strategies and testing requirements at the federal and state level.

The following describes the status of air quality pollutants and strategies.

Carbon Monoxide - Fort Collins

In the late 1980s, Fort Collins had violations of the NAAQS for CO. As a result, its previous nonattainment status continued with the passage of the Clean Air Act Amendments of 1991. In the 1990s, CO levels improved substantially, and Fort Collins was redesignated to a maintenance area in July 2002. The maintenance status remains for 20 years after the redesignation but the control strategies have been removed.

Denver/North Front Range 8-Hour Ozone Nonattainment Area

Ground level ozone is created when VOC and NO_x are emitted and mixed with heat in the atmosphere. In November 2007, the EPA designated the Denver/North Front Range region as a nonattainment area for the 8-hour ozone due to violations of the 8-hour ozone standard that occurred in the summer of 2007.

There have been subsequent revisions to the standard and reclassification of the category since that time, although the boundary has remained constant, as shown in Figure 3. On May 21, 2012, the region was designated as marginal nonattainment for the 0.075 parts per million (ppm) from the prior 0.080 ppm. On May 4, 2016, the EPA final rule determined that the marginal category failed to attain the standard, and the area was reclassified as moderate, moving further up the scale of more restrictive compliance requirements. The reclassification triggered additional planning requirements, including a revision to the State Implementation Plan (SIP).

The most recent SIP is the *Moderate Area Ozone SIP for the Denver Metro and North Front Range Nonattainment Area*, approved November 17, 2016, by Colorado Air Quality Control Commission. This plan is for the nonattainment area with the standard of 0.075 ppm and a classification of moderate. The Regional Air Quality Council is responsible for the development of the SIPs. Implementation is the responsibility of the Colorado Department of Public Health & Environment.

The SIP identifies control measures for implementation to bring the area back into compliance with the standards. Mobile source emissions, identified in the SIP, include vehicle emissions which are a significant component contributing to the overall emissions of VOC and NO_x. Progress has been made, as noted in the SIP, in reducing the emissions as shown in Table 3 and Table 4. The most notable control strategy in Larimer County is the return of vehicle emission testing.

Table 3. VOC Emissions Reduction from 2011 to 2017

Source Sector	2011 VOC Emissions (tons per day)	2017 VOC Emissions (tons per day)	Percent VOC Emissions Reduction from 2011 to 2017
Oil and Gas	279.8	154.0	
Point	26.6	28.4	
Area	60.6	67.5	
Non-Road Mobile	58.2	44.3	
On-Road Mobile	93.7	55.0	
Total All Categories	518.8	349.2	

Source: Colorado Department of Public Health & Environment and Regional Air Quality Council, 2016

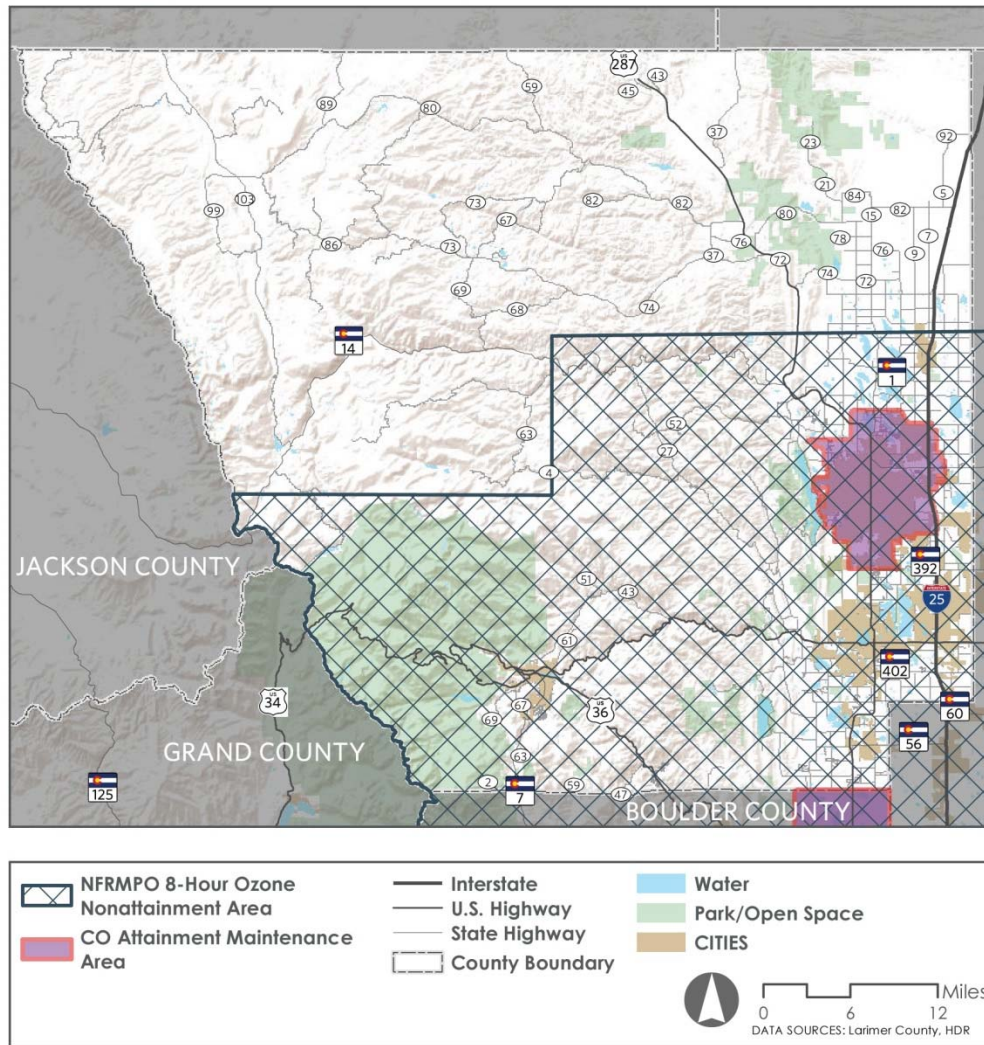
¹ https://raqc.egnyte.com/dl/uJfKleU67/FinalModerateOzoneSIP_2016-11-29.pdf

Table 4. NO_x Emissions Reduction from 2011 to 2017

Source Sector	2011 NO _x Emissions (tons per day)	2017 NO _x Emissions (tons per day)	Percent NO _x Emissions Reduction from 2011 to 2017
Oil and Gas	41.4	65.8	
Point	60.7	40.1	
Area	0.0	0.0	
Non-Road Mobile	75.9	54.9	
On-Road Mobile	142.0	73.3	
Total All Categories	320.0	234.0	

Source: Colorado Department of Public Health & Environment and Regional Air Quality Council, 2016

Figure 3. Carbon Monoxide & 8-Hour Ozone Areas



² https://raqc.egnyte.com/dl/uJfKleU67/FinalModerateOzoneSIP_2016-11-29.pdf

Resiliency Planning

The Colorado Resiliency Working Group, created by the Colorado Resiliency and Recovery Office, has defined resiliency as “the ability of communities to rebound, positively adapt to, or thrive amidst changing conditions or challenges - including disasters and climate change - and maintain quality of life, healthy growth, durable systems, and conservation of resources for present and future generations.” Resiliency is an increasingly important concept in Colorado following the floods and fires of 2012 and 2013, which had significant and severe consequences for the region. The Colorado landscape, though beautiful, presents many challenges for resiliency planning because of rough terrain, dry summers, and variable weather conditions year-round.

Two large wildfires occurred in 2012. The Hewlett Gulch fire (7,685 acres) and the High Park fire (87,284 acres) were both located northwest of Fort Collins. In addition to the loss of homes, these fires burned roadway infrastructure, as well as signs, and created high runoff from rain events that caused issues with lakes and reservoirs that are used for water supply for the cities and towns in Larimer and Weld Counties.

What does resiliency mean to transportation planning?

Providing redundancy in the transportation network and maintaining existing infrastructure reduces the severity of threats from natural hazards. Resiliency also depends on the transportation network for other reasons, such as providing access to resources and emergency management services and identifying safe routes for transport of hazardous materials.

Floods can occur from high rainfall events as happened in September 2013, when up to 17 inches of rain fell in one week. Larimer County was hit hard with 1,120 square miles affected by flooding, and 47 homes and seven businesses destroyed. An additional 338 homes and 25 businesses were damaged. There was extensive road damage in the Big Thompson Canyon and many of the surrounding County roads. US Highways 36 and 34, the major routes into Estes Park, were severely damaged. Estes Park residents were isolated by the destruction of sections of Fish Creek Road and all nine crossings of Fish Creek.

2013 Flood Damage



Larimer County's resiliency planning efforts have examined problems experienced by the County in past natural hazards, and identified strategies to mitigate the same threats in the future. Specifically, Larimer County conducted the *Unmet Needs & Community Fragility Study* in 2015 to identify the County's remaining needs to recover from the wildfires and floods. The study also identified vulnerabilities in each community within Larimer County even if unaffected by recent disasters.

In 2016, the County continued its work on improving resiliency and completed the *Larimer County Multi-Jurisdictional Hazard Mitigation Plan*. Additionally, a large stakeholder group of Larimer County, the City of Fort Collins, the City of Loveland, the Colorado Department of Local Affairs, and the Colorado Resiliency and Recovery Office, among others developed the *Larimer Community Resiliency Framework* to better prepare local communities for future hazards. The Board of County Commissioners approved the Framework and agreed to work in partnership with other Larimer County jurisdictions in support of the goals.

The *Larimer Community Resiliency Framework*, the *Larimer County Multi-Jurisdictional Hazard Mitigation Plan*, and the *Unmet Needs & Community Fragility Study* are summarized in Table 5.

Table 5. Summary of Resiliency Planning Efforts

	Larimer Community Resiliency Framework (2016)	Larimer County Multi-Jurisdictional Hazard Mitigation Plan (2016)	Unmet Needs & Community Fragility Study (2015)
Vision / Purpose	<p>A connected, collaborative, and cooperative region where:</p> <ul style="list-style-type: none"> • Cities, rural communities, and agriculture are valued and supported by long-range, regional, comprehensive planning. • There is a diverse range of housing and multi-modal transportation systems. • Critical infrastructure has built-in redundancy. • County residents understand their risks, and communities and individuals are self-sufficient and take responsibility for their own and their collective preparedness. • The economy is diverse, vibrant, and sustainable with a trained, diverse workforce that fosters equitable access to the social services and education needed to maintain capacity, flexibility, and high quality of life. • The natural environment is valued, protected, and responsibly managed. Infrastructure is moved from/kept out of high risk areas. 	<ul style="list-style-type: none"> • Protect life and property by reducing the potential for future damages and economic losses that result from natural hazards. • Qualify for additional grant funding, in both the pre-disaster and post-disaster environment. • Provide quick recovery and redevelopment following future disasters. • Integrate other existing and associated local planning documents. • Demonstrate a firm local commitment to hazard mitigation principles. • Comply with state and federal legislative requirements tied to local hazard mitigation planning. 	<ul style="list-style-type: none"> • Link assessments on community fragility and unmet needs for the purposes of creating a comprehensive assessment of Larimer County continued recovery needs.
Transportation Goals	<ul style="list-style-type: none"> • Implement regional, long-range, comprehensive planning. • Develop and fund a regional, multimodal transportation network. • Build public-private sector partnerships to support and achieve the community's vision and goals. 	<ul style="list-style-type: none"> • Protect people, property, and natural resources. • Improve capability to reduce disaster losses. • Integrate hazard mitigation into other planning mechanisms. 	<ul style="list-style-type: none"> • "Bounce forward" instead of just bouncing back.
Transportation Recommendations / Projects	<ul style="list-style-type: none"> • Northern Colorado Community Connectivity Project: In the initial phase, the three I-25 bridges at Little Thompson, Big Thompson, and Poudre River crossings would be replaced, simultaneously implementing stream improvement projects and installing greenways that connect the west and east sides of I-25. • US 34 permanent repairs between Estes Park and Loveland. • Identify potential weak or choke points in infrastructure and develop mitigation strategies and/or education. • Develop a clear hierarchy of needs in infrastructure repair/upgrade/installation. • Communities' access points should be reviewed and, where needed, upgraded to assure resilient ingress and egress. 	<ul style="list-style-type: none"> • Bridge Improvement Project: The 2012 High Park Wildfire and the 2013 flood caused the Public Works Division to delay necessary bridge improvements due to the wide-scale destruction of roads and bridges throughout Larimer County. Therefore, structurally deficient bridges exist that must be replaced. In accordance with the <i>Larimer County Strategic Plan</i>, replace all structurally deficient bridges in Larimer County by 2020. • Review and update the Transportation Master Plan. 	<ul style="list-style-type: none"> • Continue working with local communities to identify secondary egress routes and work with private land owners to secure access to private roads during emergencies. • Conduct a detailed assessment of critical infrastructure and access issues to provide a clearer picture of the need and available options in each community. • Bring all bridges to sufficient status by 2020. • Continue current efforts toward resilient infrastructure and lifelines, including redundancies and back-ups so that when one failure occurs, another system will work in its place.

Demographics

The need for improved transportation infrastructure is driven by growth in Larimer County and across the Colorado Front Range—the rapidly urbanizing area on the plains adjacent to the Rocky Mountains between Pueblo and Fort Collins. Infrastructure investments for both maintenance and upgrades connect growing communities; provide access to recreation and local, state, and national parks; and serve the local transportation needs of all residents in the County.

Between 2010 and 2016, Colorado was the fourth-fastest growing state in the nation by percentage. Colorado added more than 500,000 people to its population in that same time period, an increase of 10.2 percent.³

Much of this growth is occurring in the Colorado Front Range. Since 2010, the Colorado Front Range population has increased from 4.2 million to 4.6 million. The growth rate is also increasing; in 2007, net migration was fewer than 30,000 people, and by 2015, that number had jumped to more than 65,000 people.

Larimer County

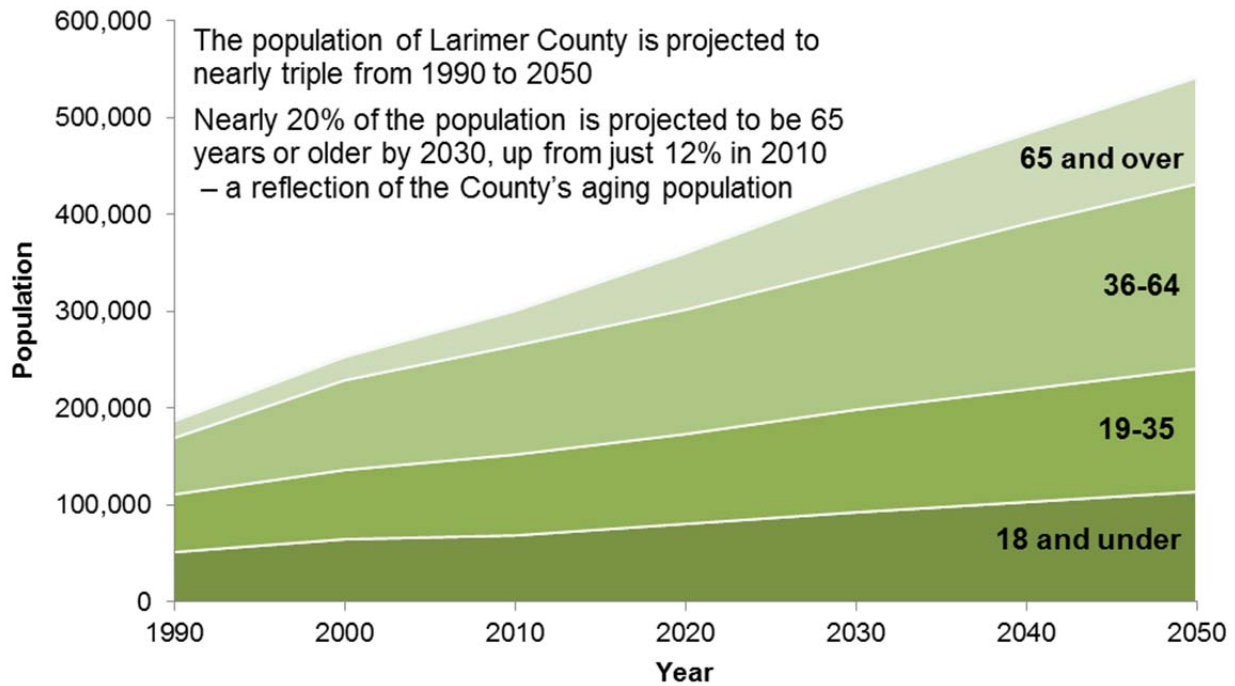
According to 2015 estimates from the state demographer, the County is home to 332,800 residents, making it the sixth-most populous County in Colorado. The County has two major cities (Fort Collins and Loveland) and six towns (Berthoud, Estes Park, Johnstown, Timnath, Wellington, and Windsor). The majority of the population is within these municipalities, with only 21 percent, or 68,200 residents, in the unincorporated areas of the County.

The County has seen a steady increase in population, as depicted in Figure 4. Between 1990 and 2010, the population grew by 61 percent. The County's growth is expected to continue, resulting in a population of more than 542,000 by 2050.

Figure 4 also shows that the population growth in the County will contain a larger portion of people over the age of 65 in the future. The increase in the oldest age bracket is relevant because this population segment can require different services than those provided for residents in other age brackets. People over 65 years of age tend to not drive as much but still need freedom of mobility and access to services.

³ US Census Bureau, Population Division.

Figure 4. Larimer County Age Distribution



Source: Colorado Department of Local Affairs, Demography Division, 2016

Urban Areas

Between 1980 and 2015, Fort Collins more than doubled in size from 65,000 residents to more than 160,000. Loveland has also seen immense growth, growing from 30,000 residents in 1980 to almost 75,000 in 2015.

The combined population of the six towns in Larimer County (Berthoud, Estes Park, Johnstown, Timnath, Wellington, and Windsor) has grown 450 percent in the same time period. These six towns had a combined population of 29,200 residents in 2015, or almost 9 percent of the County’s population.

Unincorporated Areas

The unincorporated areas account for 21 percent of the County’s population, but have not experienced the same growth rates as those in urban areas of the County. Between 1980 and 2015, the unincorporated Larimer County population grew 44 percent compared to the overall County population growth of 223 percent.

As unincorporated areas are developed and begin to grow, nearby cities and towns incorporate these newly developed areas, partially explaining the smaller growth in unincorporated areas. This can be seen in the cases of Johnstown and Windsor, both of which were fully contained in neighboring Weld County in 1980. As development occurred on the eastern border of Larimer County, these towns expanded into Larimer County, and that population growth was then categorized as urban instead of rural.

Guiding Principles

The following guiding principles were developed as part of this current planning process. These guiding principles were used to identify needs within the transportation network and to prioritize improvements. Each guiding principle is accompanied by specific goals and strategies.



Guiding Principle 1: Provide a safe transportation network to move people and goods through all modes of travel.

- A. Reduce crash rates at intersections and on roadways with the highest crash rates and crash counts.
 - i. At a minimum, annually collect and analyze crash data to provide a comprehensive understanding of safety issues.
 - ii. Incorporate design solutions where appropriate to enhance both vehicular and non-vehicular user safety, such as designated pedestrian/ bicycle facilities, wildlife corridor grade-separated crossings, and roundabouts.
 - iii. Evaluate and choose the appropriate type of improvement to address the types of crashes occurring, based on ongoing safety reports.
- B. Reduce the rate of severe crashes that result in serious injuries and fatalities.
 - i. Review fatal crashes to determine crash causes and crash factors. Design features such as horizontal and vertical curves, bicycle and pedestrian facilities, and design speeds should be assessed in addition to human factors.
 - ii. Improve roadside safety by restricting fixed object placement, adding barriers where appropriate, and improving sight distances to the extent feasible.
- C. Identify opportunities to upgrade rail crossing safety along County roads.
 - i. Maintain railroad crossing database, and provide County roadway Average Daily Traffic to the Federal Railroad Administration every five years.



Guiding Principle 2: Maintain the transportation network to optimize investment in the transportation infrastructure.

- A. Maintain the County mainline paved roadway system to an overall pavement condition index of 70 or better.
- B. Maintain the County mainline non-paved roadway system.
 - i. Investigate strategies for monitoring the conditions of non-paved roadways.
 - ii. Implement best management practices to mitigate dust, improve safety, and minimize maintenance cost of non-paved roads.
- C. Maintain bicycle and pedestrian facilities within the County mainline right-of-way.
- D. Repair, rehabilitate, or replace major and minor bridge structures based on the bridge inspection report and evaluation criteria.



Guiding Principle 3: Diversify the transportation network by considering the development and use of alternative transportation modes during the planning and design process of each transportation project.

- A. Provide road rights-of-way and cross sections that are wide enough to accommodate all identified users and functions (autos, transit vehicles, pedestrians, and bicyclists), as practical and feasible.

- i. To accommodate bicycles and pedestrians, the paved cross section should be consistent with design standards depending on terrain and other limitations.
- B. Consider bicycle facilities, such as wide shoulders and bicycle lanes, on roadways that experience high bicycle demand and would provide continuity in the regional bicycle network, where practical.
- C. Consider pedestrian crossing improvements where conditions warrant.
- D. Coordinate with transit providers to increase the accessibility of transit services in unincorporated Larimer County.



Guiding Principle 4: Upgrade and expand the County roadway network to respond to the needs of growth and economic development to provide for the efficient movement of citizens, goods, and services.

- A. Expand and upgrade existing facilities to maintain a minimum Level of Service D in urban areas and Level of Service C in rural areas.
 - i. Prior to road widening to improve capacity, evaluate the costs and benefits of alternative capacity enhancement strategies.
 - ii. Identify non-paved roads that have exceeded the Average Daily Traffic threshold for paving and prioritize those sections in the Capital Improvement Program funding stream.
 - iii. Follow land use code as it pertains to transportation facilities.
 - iv. Implement access management standards along mainline County roadways to maintain mobility at the desired level of service.
- B. Consider intersection control improvements when signal warrants are met.
 - i. When a signalized intersection is warranted, consider alternative intersection control types such as roundabouts as an alternative to signalizing the intersection.
- C. Consider new roadway connections in areas experiencing growing demand, where expansion of existing facilities is neither sufficient nor feasible.
 - i. Coordinate with other agencies and private developers to equitably share costs and provide resources.
- D. Incorporate the findings and advance the recommendations of the *Larimer Community Resiliency Framework*.
- E. Identify potential and existing freight corridors. Consider safety and capacity improvements on these corridors, as necessary, to be consistent with freight use.



Guiding Principle 5: Establish and implement a Capital Improvement Program for County transportation facilities.

- A. Identify a methodology for prioritizing projects which emphasizes the importance of maintaining the existing roadway system.
- B. Consider consistency with the *Larimer County Master Plan* as an element of project prioritization for roadway maintenance and improvement.
- C. Identify methods to share costs with adjacent cities and other governmental entities.
- D. Consider identifying dedicated funding for alternative transportation modes.
- E. Update the Transportation Capital Improvement Program on an annual basis.

The following chapters of this plan correspond to the themes of these guiding principles. The guiding principle, goals, and strategies are repeated at the beginning of each chapter.



Safety

Safety

Guiding Principle 1: Provide a safe transportation network to move people and goods through all modes of travel.

Goals and strategies to support Larimer County's efforts to improve safety for all modes:

- A. Reduce crash rates at intersections and on roadways with the highest crash rates and crash counts.
 - i. At a minimum, annually collect and analyze crash data to provide a comprehensive understanding of safety issues.
 - ii. Incorporate design solutions where appropriate to enhance both vehicular and non-vehicular user safety, such as designated pedestrian/ bicycle facilities, wildlife corridor grade-separated crossings, and roundabouts.
 - iii. Evaluate and choose the appropriate type of improvement to address the types of crashes occurring, based on ongoing safety reports.
- B. Reduce the rate of severe crashes that result in serious injuries and fatalities.
 - i. Review fatal crashes to determine crash causes and crash factors. Design features such as horizontal and vertical curves, bicycle and pedestrian facilities, and design speeds should be assessed in addition to human factors.
 - ii. Improve roadside safety by restricting fixed object placement, adding barriers where appropriate, and improving sight distances to the extent feasible.
- C. Identify opportunities to upgrade rail crossing safety along County roads.
 - i. Maintain railroad crossing database, and provide County roadway Average Daily Traffic to the Federal Railroad Administration every five years.

Roadway Safety

Roadway safety can be analyzed by sections of roadway or by intersection. The crash types that occur at these two locations vary, and therefore, analyzing safety by both categories is the most comprehensive approach.

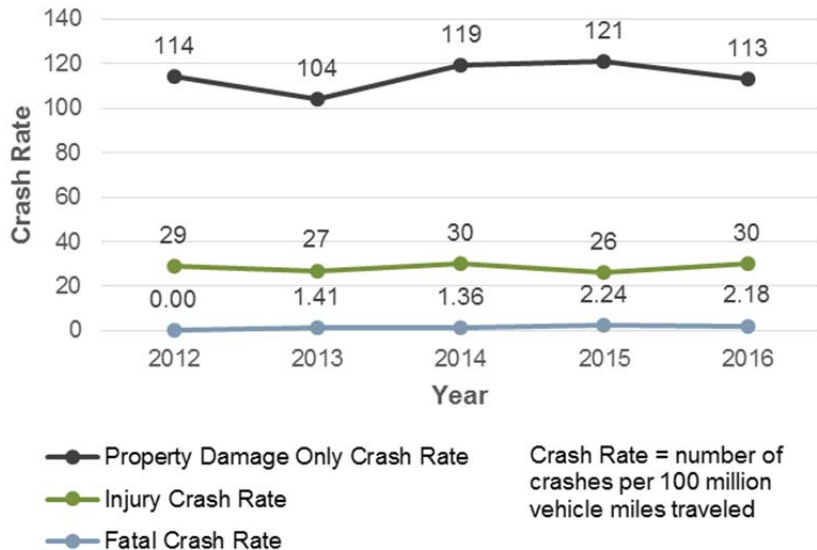
2016 Traffic Safety Report

A traffic safety report is prepared annually by Larimer County Engineering staff that assesses the transportation system and identifies areas for further study to address crashes. This report describes the general state of transportation safety in the County and identifies short-term solutions to address crash trends. The *2016 Traffic Safety Report* can be found online at:

http://larimer.org/engineering/Transportation/AnnualReports/LCSP_2016_Annual_Report.pdf

There was an average of more than 400 crashes per year on County roads between 2012 and 2016. The total number of crashes decreased slightly by less than one percent. However, the number of injury crashes increased approximately 16 percent from 2012 to 2016. Fatal crashes have remained the same from the previous year at seven.

Figure 5. Crash Rates on Unincorporated Roads



A way to compare crashes across Colorado is by using a crash rate. A crash rate is expressed in the number of crashes per 100 million vehicles miles traveled (VMT). The *Colorado Problem Identification Report*, Colorado Department of Transportation, Fiscal Year 2016, shows that the average annual (2009-2014) statewide injury crash rate per 100 million VMT is 20.9, while Larimer County (2014-2016) has 28.2 injury crashes per 100 million VMT annually. The crash rate on the unincorporated Larimer

Source: Larimer County 2016 Traffic Safety Report

County roadway system is higher than the statewide crash rate that includes the interstate and state highway system. This is consistent with many safety trends in rural counties across Colorado.

Specific issues identified in the *2016 Traffic Safety Report* are summarized below.

- Roadway departures continue to be the most common crash type and accounted for five of the seven fatal crashes.
- Driving under the influence decreased by seven percent.
- Animal-related crashes increased by nine percent with most of them involving deer in October and November.
- Distracted driving, most notably from cell phones, increased by 26 percent statewide with the County showing a four percent increase.
- 82 percent of motorcycle crashes resulted in injury or death, compared to 16 percent in other vehicles.

Recent safety projects from the annual safety report and other planning efforts have included:

- **Installation of a traffic signal.** The County installed a traffic signal at the intersection of CR 13E (Monroe Avenue) and CR 28 (57th Street) in 2016 to combat a recent increase in broadside crashes. The signal increases intersection capacity.
- **Installation of milepost markers.** In 2016, the County installed milepost markers in the foothills and mountainous areas of the County to assist emergency responders in quickly locating crashes that occur on remote highways.
- **Installation of a pedestrian hybrid beacon.** To improve pedestrian and bicycle safety, the County installed a pedestrian hybrid beacon on CR 11C approximately 0.5 mile south of CR 30. When activated, the beacon sets off flashers 750 feet in advance of the crossing to alert motorists

to the presence of a pedestrian or bicyclist, requiring the motorist to stop. The crossing also has a pedestrian countdown display.

- **Complete roadway reconstruction.** CR 11C is a popular route for both motorists and bicyclists. The County reconstructed the roadway in 2016 from the Horseshoe Lake outlet to Boyd Lake to just south of CR 28 (57th Street) with six-foot shoulders to more safely accommodate bicyclists.

The annual safety report identifies specific projects each year to improve multimodal safety within the County. In addition to these specific projects, the County is seeking to reduce the number and severity of crashes through the installation of roundabouts where appropriate. Figure 6 shows a comparison of crash severity at five Larimer County intersections (CR 19 at CR 48 (Vine Drive), CR 9 at CR 30, CR 19 at CR 70, CR 11C at CR 30 and CR 11 at CR 30) before and after installation of roundabouts. As shown, safety performance at the five intersections has improved, with approximately the same number of minor crashes, and zero crashes that resulted in injury or death.

Figure 6. Before & After Roundabout Construction Crash Comparison

Before Roundabout Construction After Roundabout Construction



■ Property Damage Only Crashes per Year ■ Injury Crashes per Year ■ Fatal Crashes per Year

Source: Larimer County 2016 Traffic Safety Report

CDOT Intersection Priority Study

In September 2016, CDOT completed the *Region 4 Intersection Priority Study* to identify and prioritize intersection improvements in Region 4, where Larimer County is located, based on a comprehensive review of the safety, operational, and geometric considerations. The study began with approximately 4,000 intersections in Region 4 that include at least one state highway, and concluded with a prioritized list of 25 intersections with project recommendations for each of these intersections to improve safety and traffic flow.

Prior to beginning the study, CDOT's Traffic and Safety Branch identified 600 of the approximately 4,000 intersections that had crash histories greater than the average of comparable intersections statewide. In Phase 1, CDOT reviewed crash data from 2010-2014, traffic operations data, and input from local agencies to narrow down the preliminary list of 600 to 120 intersections.

In Phase 2, CDOT met with local agencies and assessed the potential for projects to reduce crashes and/or improve traffic flow for the remaining 120 intersections. This assessment resulted in a revised intersection list, which was narrowed down to 40 intersections during Phase 3. CDOT conducted site visits and detailed traffic operations analysis, and produced crash reduction estimates for each of the remaining 40 intersections. Evaluation criteria included safety rating, safety benefit-cost ratio, traffic operations benefit-cost ratio, ease of action, and local agency support. As a result, CDOT was able to develop a prioritized list of 25 intersections based on a combination of safety and operational need.

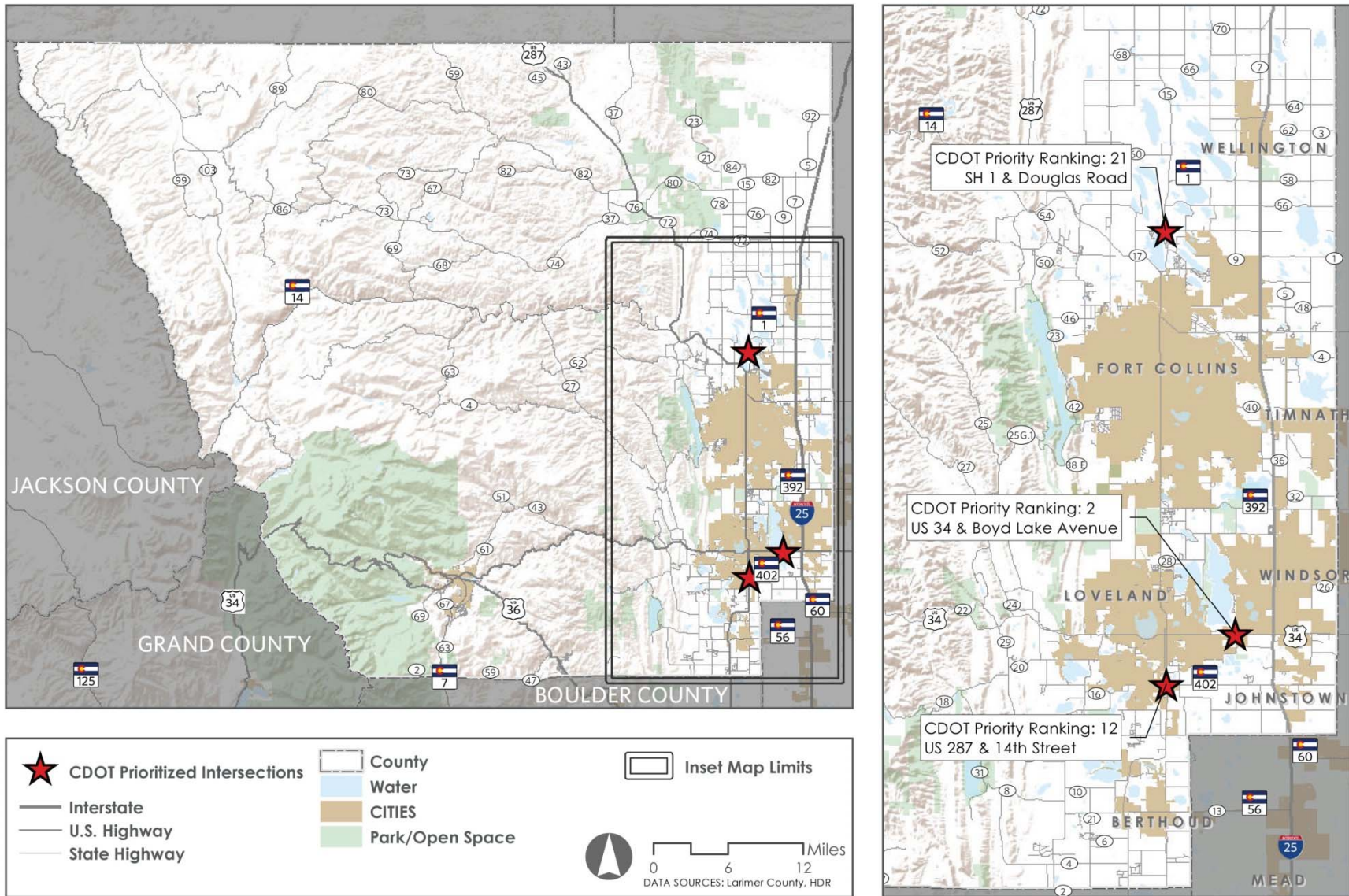
Three of the 25 prioritized intersections from CDOT’s study are in Larimer County. Only one (SH 1 and CR 54) is wholly within Larimer County’s jurisdiction; two have at least one leg of the intersection within Larimer County’s jurisdiction. Project recommendations for these three intersections can be found in Table 6, and a map of these locations can be found in Figure 7.

Table 6. CDOT Prioritized Intersection Improvements

CDOT Region 4 Priority Ranking	Intersection	Recommended Improvements
2	US 34 (Eisenhower Boulevard) & Boyd Lake Avenue (CR 9)	The City of Loveland is currently designing improvements for this intersection that include roadway widening, additional left-turn lanes on each approach, and signal modifications.
12	US 287 (Lincoln Avenue) & 14 th Street (SH 402, CR 18)	Install flashing yellow arrow (FYA) signal heads for the northbound and southbound approaches, including replacing the existing signal poles to place the FYA signal heads over the left-turn lanes. With the FYA heads in place, protected-only phasing by time of day could be implemented, if necessary, to reduce the frequency of approach turn type crashes.
21	SH 1 & Douglas Road (CR 54)	Install a traffic signal constructed to meet current CDOT standards.

Source: CDOT Region 4 Intersection Priority Study, 2016

Figure 7. State Highway Intersections Prioritized for Improvements in Larimer County



Crash Data Analysis

For analysis purposes, Larimer County’s roadway network is split into over 600 traffic sections ranging from 0.2 mile to more than 15 miles long. Safety data from 2013 through 2015 were used to calculate weighted crash counts and crash rates per million VMT to provide an understanding of needed improvements to lower crash rates.

Weighted Crash Counts. A weighting process was identified for crash counts to denote the differing severity in crash types - property damage only (1), injury (5), and fatality (12).

Crash Rates per Million VMT. Crash rates are typically calculated per million VMT to take into account both the length of the section and the traffic volumes. This prevents the crash rate from being particularly high on a short section or a section with low volumes when even one crash occurs.

Using these two metrics, safety performance was determined for the 2013 through 2015 period as follows:

- **Low:** One or more fatalities; or weighted crash count ≥ 15 AND crash rate per million VMT ≥ 2 .
- **Medium:** Crashes have occurred, but do not meet criteria for Low Safety Performance category.
- **High:** No crashes.

A summary of these performance measures can be seen in Table 7. Specific safety needs are highly variable and could not be determined based on this high-level analysis. Each section identified as having low safety performance should be further analyzed to determine what design change, if any, could be made to improve safety. For reference, the social costs of safety problems are presented. These costs are an indicator of the impact to the community that crashes have, and were calculated based on US Department of Transportation (DOT) guidance.^{4,5}

Table 7. Safety Performance and Crash Type

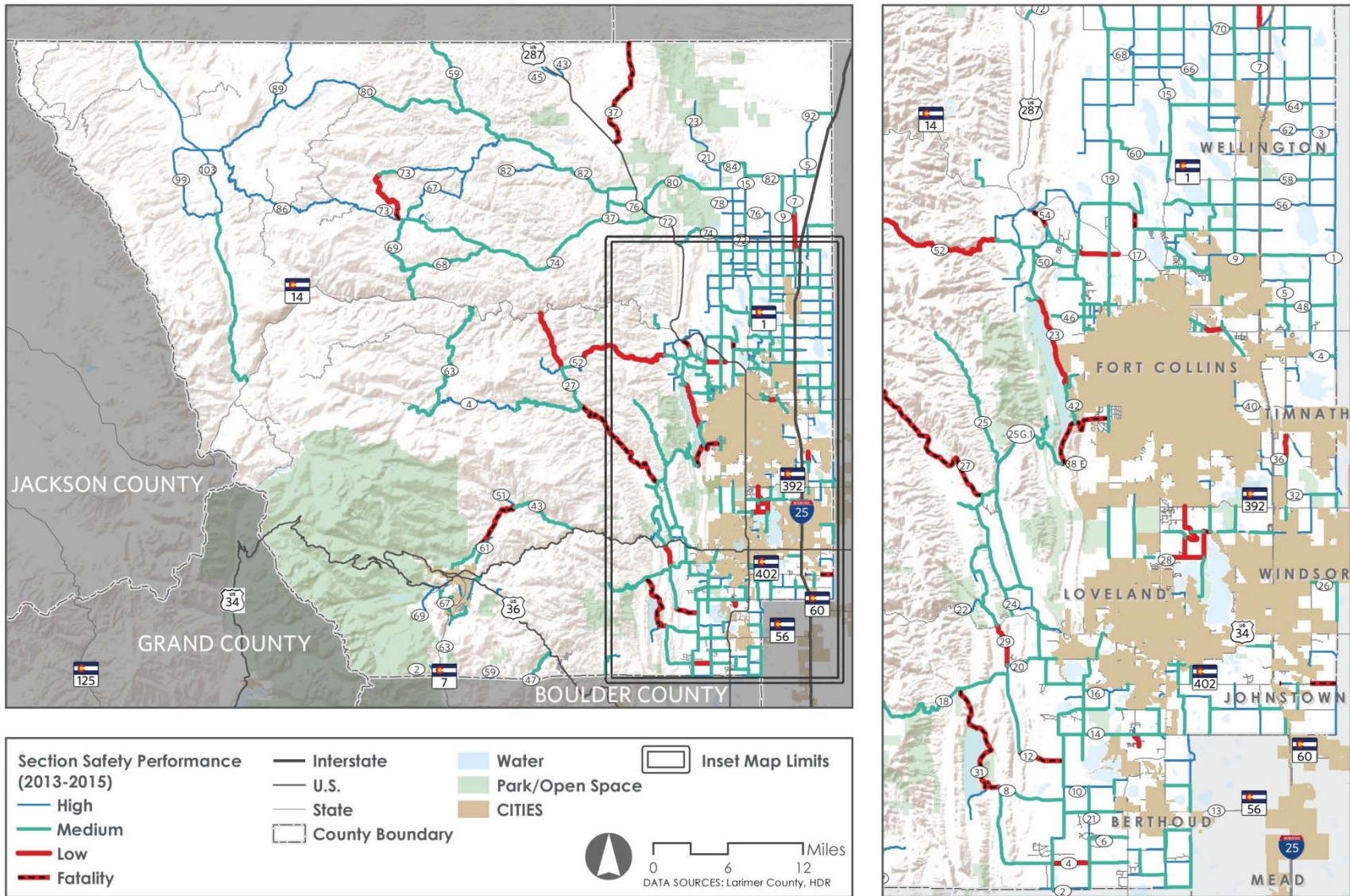
Safety Performance	Number of Traffic Sections	Property Damage Only	Injuries	Fatalities	Economic and Social Cost of Crashes (millions of 2015 \$)
Low: No Fatalities	20	226	82	0	\$15.2
Low: Fatality	13	62	31	14	\$140.1
Medium	288	693	130	0	\$25.5
High	306	0	0	0	\$0.0
Total	627	981	243	14	\$180.8

These safety performance categories can be seen in Figure 8. Details by traffic section can be found in Appendix A.

⁴ US DOT, Guidance on Treatment of the Economic Value of a Statistical Life in US Department of Transportation Analyses, 2016.

⁵ US DOT, TIGER BCA Resource Guide and The Economic and Societal Impact of Motor Vehicle Crashes, 2010.

Figure 8. Safety Performance by Roadway Section



Bicycle & Pedestrian Safety

Between 2011 and 2015, there was an average of eight bicycle crashes per year on roads in unincorporated Larimer County. Bicycle crashes tend to be severe; 73 percent resulted in an injury, including two fatalities.⁶

Within the same timeframe, there were eight total crashes involving pedestrians resulting in zero fatalities and five injuries. Like bicycle crashes, the number of pedestrian crashes is low, but the severity is high. As a comparison, the City of Fort Collins averages 45 pedestrian crashes per year, mostly at signalized intersections or midblock crossings in areas with high pedestrian volumes.

The County will pursue bicycle and pedestrian improvements where appropriate, such as widened shoulders, hybrid flashing beacons at trail crossings, Safe Routes to School, and others. The County will review safety data during the planning and design of capital improvement projects to determine the need for bicycle and pedestrian treatments.

Narrow Shoulders for Bicycling



Railroad Crossing with Gates & Flashers



Railroad Crossing Safety

The rail transportation system in Larimer County includes the BNSF Railway, the Union Pacific Railroad (UPRR), and the Great Western Railway (GWR). Within Larimer County, there are approximately 52 miles of BNSF Railway tracks, 22 miles of UPRR tracks with a switch yard in Fort Collins, and 19 miles of GWR tracks. The rail lines do not provide passenger rail service. Figure 9 shows the existing rail system in Larimer County.

Along the 93 miles of rail, there are 25 public railroad crossings in unincorporated Larimer County. Most of these crossings are at grade and along rural roadways. Table 8 is a full list of these crossings.

The County will continue to coordinate with the FRA on potential crossing safety improvements.

Safety Initiatives

The County will continue to address safety needs through the following initiatives:

- Annual traffic safety report
- Bicycle and pedestrian improvements incorporated into future projects
- Safety data analysis
- Design review for future capital improvements
- Safe Routes to School
- FRA coordination to improve safety at railroad crossings
- Roundabout installations where appropriate
- Low-cost safety program

⁶ 2015 Traffic Safety Report. Larimer County Engineering Department.

Figure 9. Rail Lines in Larimer County

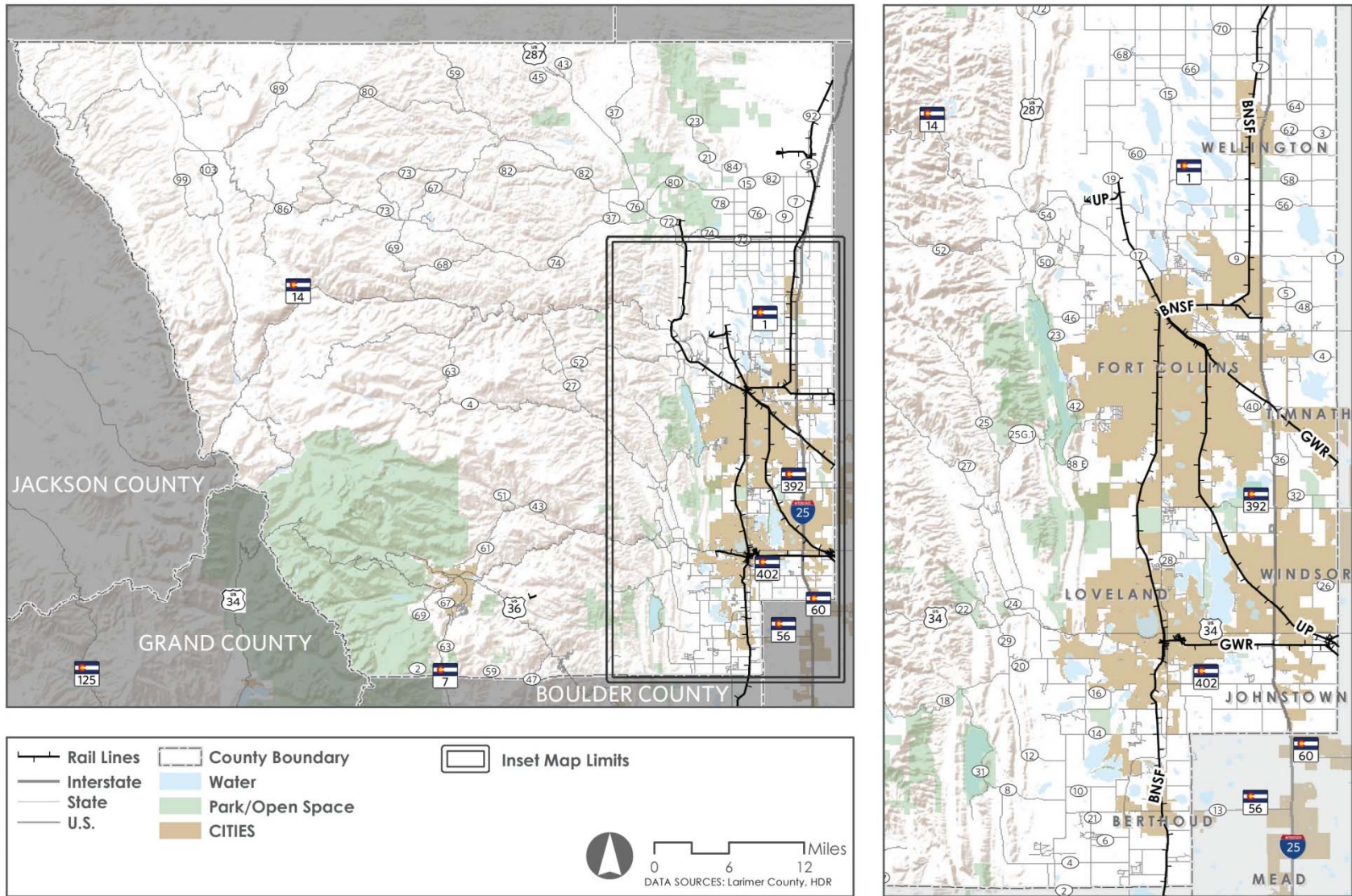


Table 8. Public Railroad Crossings in Unincorporated Larimer County

DOT Crossing Inventory Number	Railroad	Position	Crossing Street	Closest City/Town	Control Device
244951B	BNSF	At Grade	Douglas Road	Wellington	Crossbucks & stop sign
244952H	BNSF	At Grade	CR 56	Wellington	Crossbucks
244953P	BNSF	At Grade	CR 58	Wellington	Gates with flashers
244958Y	BNSF	At Grade	CR 66	Wellington	Flashers
244960A	BNSF	At Grade	CR 68	Wellington	Crossbucks
244961G	BNSF	At Grade	Owl Canyon Road	Wellington	Gates with flashers
244962N	BNSF	RR Over	CR 7	Wellington	N/A
244963V	BNSF	At Grade	Buckeye Road (CR 82)	Wellington	Gates with flashers
244966R	BNSF	At Grade	CR 92	Wellington	Gates with flashers
245017G	BNSG	At Grade	County Line Road (CR 2)	Berthoud	Gates with flashers
245018N	BNSF	At Grade	CR 2E	Berthoud	Gates with flashers
245020P	BNSF	At Grade	CR 15A	Berthoud	Gates with flashers
245021W	BNSF	At Grade	CR 15A	Berthoud	Crossbucks
245026F	BNSF	At Grade	CR 10E	Berthoud	Gates with flashers
245027M	BNSF	At Grade	42nd Street SW (CR 14)	Loveland	Gates with flashers
245029B	BNSF	At Grade	CR 16	Loveland	Gates with flashers
245150L	BNSF	At Grade	Richards Lake Road (CR 52)	Fort Collins	Gates with flashers
804315B	UPRR	At Grade	CR 30	Loveland	Gates with flashers
804316H	UPRR	At Grade	CR 11	Fort Collins	Gates with flashers
804512P	UPRR	At Grade	Willox Lane	Fort Collins	Crossbucks
804515K	UPRR	At Grade	CR 56	Fort Collins	Gates with flashers
804516S	UPRR	At Grade	CR 19	Fort Collins	Gates with flashers
849368B	GWR	At Grade	CR 20C	Loveland	Crossbucks
872118W	GWR	At Grade	CR 3	Loveland	Crossbucks

SAFETY SUMMARY

Guiding Principle



Provide a safe transportation network to move people and goods through all modes of travel.

Existing & Future Conditions

- **High Crash Rate:** Between 2011 and 2015, there were more than 400 crashes per year on county roads on average.
- **More Injuries:** Larimer County has a higher injury crash rate than the state average.
- **Rural Roads:** Rural two-lane roads have the highest risk within the road system.
- **High Social Cost:** Crashes on County roads from 2013-2015 will have a lifetime social and economic cost of more than \$180 million.

2016 TRAFFIC SAFETY REPORT. There was an average of more than 400 crashes per year on County roads between 2012 and 2016. Roadway departures continue to be the most common crash type and accounted for five of the seven fatalities in that time period.

CRASH DATA ANALYSIS. 33 traffic sections have low safety performance, with a combined 14 fatalities and 113 injuries from 2013 through 2015.

CDOT INTERSECTION PRIORITY. CDOT has identified three intersections at least partially within Larimer County’s jurisdiction that require operational, safety, or geometric improvements. These are:

- US 34 (Eisenhower Boulevard) & Boyd Lake Avenue (CR 9)
- US 287 (Lincoln Street) & 14th Street (SH 402, CR 18)
- SH 1 & Douglas Road (CR 54)

BICYCLE & PEDESTRIAN. Crashes involving bicyclists and pedestrians are infrequent in the County, but the severity is high when they occur. Between 2011 and 2015, there was an average of eight bicycle crashes per year, resulting in two fatalities. There were eight pedestrian crashes total in that same timeframe with no fatalities.

What is the County doing to improve safety?

Goals identified through the planning process to address safety include:

- A. *Reduce crash rates at intersections and on roadways with the highest crash rates and crash counts.*
- B. *Reduce the rate of severe crashes that result in serious injuries and fatalities.*
- C. *Identify opportunities to upgrade rail crossing safety along County roads.*

Safety initiatives in the County include:

- Bicycle and pedestrian improvements incorporated into future projects
- Safety data analysis
- Design review for future capital improvements
- Safe Routes to School
- FRA coordination to improve safety at railroad crossings
- Roundabout installations where appropriate
- Low-cost safety program
- Annual traffic safety report



Maintenance

Maintenance

Guiding Principle 2: Maintain the transportation network to optimize investment in the transportation infrastructure.

Goals and strategies to efficiently and effectively maintain the Larimer County transportation network:

- A. Maintain the County mainline paved roadway system to an overall pavement condition index of 70 or better.
- B. Maintain the County mainline non-paved roadway system.
 - i. Investigate strategies for monitoring the conditions of non-paved roadways.
 - ii. Implement best management practices to mitigate dust, improve safety, and minimize maintenance cost of non-paved roads.
- C. Maintain bicycle and pedestrian facilities within the County mainline right-of-way.
- D. Repair, rehabilitate, or replace major and minor bridge structures based on the bridge inspection report and evaluation criteria.

Overview of County Road Maintenance

Larimer County Road and Bridge Department performs maintenance on approximately 796 miles of mainline County roads and approximately 226 miles of non-mainline County roads and US Forest Service roads.

- 374 miles of mainline paved roads
- 422 miles of mainline gravel/native surface roads
- 105 miles of subdivision roads, of which there are paved and non-paved roads
- 121 miles of US Forest Service Roads

Source: Larimer County, Highway System

Improving roadway maintenance is the transportation improvement with the most public support

-Larimer County Transportation Assessment, October-November 2015

Paved road maintenance (preservation) includes crack seals, chip seals, pothole repair, and minor drainage system repairs. Paved roadway improvements include structural patching, overlay resurfacing, and major drainage system repairs. Non-paved road maintenance include drainage and re-graveling. They are graded and shaped to achieve smoothness and wearability, and some receive a treatment for dust suppression.

With a replacement cost of more than \$400 million,⁷ the approximately 1,000-mile system of public roads maintained by Larimer County makes it one of the County's most extensive and most valuable assets.

⁷ http://www.larimer.org/roads/transportation_report_card.htm

The County maintains a database of road conditions based on physical inspections of roads, measuring surface distresses, such as washboarding, rutting, cracking, and potholes. Every mainline road is physically inspected and the condition rated at least once per year.

Poorly maintained roads cost drivers money by increasing the wear and tear on vehicles. Poor road conditions may also contribute to an increase in crashes. Research has clearly shown that early preventive maintenance, particularly on paved roads, costs only a fraction of later, more extensive repair or reconstruction.

By monitoring road conditions carefully, County staff has a goal of providing cost-effective, preventive maintenance at the right time. This allows the County to stretch limited road maintenance dollars as far as possible. Over the past half-dozen years, the cost of

road maintenance (particularly the cost of equipment, fuel and asphalt products) has increased dramatically, while the level of funding for road maintenance has remained relatively flat.

The County is actively managing this divide between resources and needs. In 2007, the County’s road maintenance budget, adjusted for inflation, was \$25 million; in 2017 the budget was \$26 million, an increase of 4 percent. In that same period, the County population has increased by 21 percent.



Mainline County Road Conditions

The majority of the mainline County roads in the urban areas are paved, and many of the rural and mountainous roads are non-paved. About 51 percent of the miles on the County roadway network are paved; about 49 percent of the roadways in the County system are non-paved and maintained as treated gravel or native roads. A *Pavement Management Report, Paved and Non-Paved Roads*, is completed each spring based on the previous year’s assessment. The information below is from the March 2017 report.

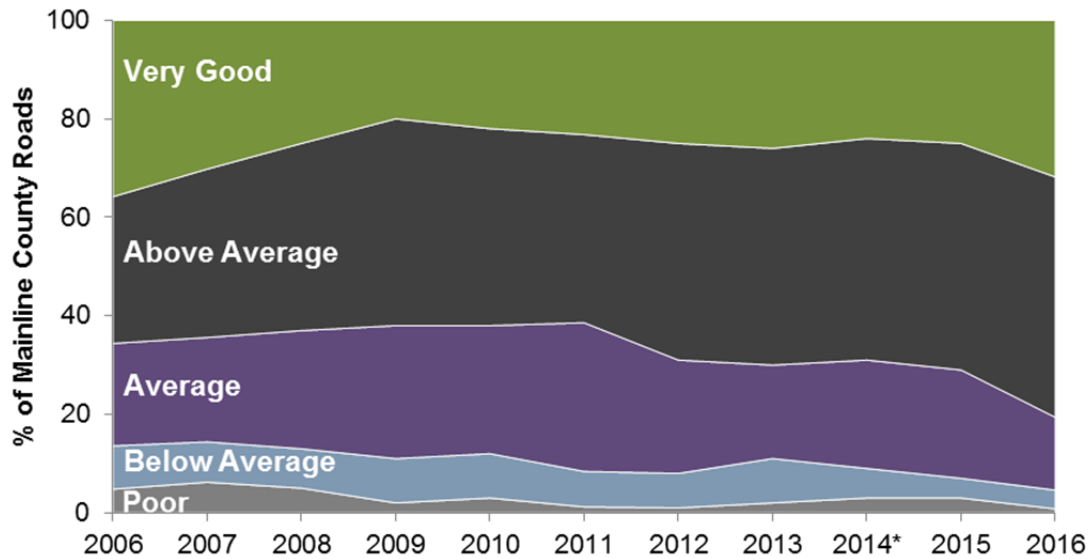
Paved Roads

The County maintains 374 miles of paved mainline roads. The County is divided into four maintenance areas for paved roads, so that every year one of the districts is the recipient of the maintenance work that includes, but is not limited to, chip seal, crack seal, and overlays. Effort to maintain them involves the following:

- Striping
- Sealcoat application
- Repairs – patching
- Resurfacing overlays
- Drainage
- Signing
- Mowing
- Snow and ice control

Larimer County assesses all of the pavement conditions on its roadway system annually using a PCI ranging from 1 to 100, with a value of 100 representing a newly constructed roadway. The rating system is like a school report card A through F, with A being Very Good (PCI of 90 to 100) and F being Poor (PCI of 1 to 20). Figure 10 shows the percentage of the mainline County roads by their condition since 2006.

Figure 10. Mainline Road Condition by Year



*2014 data excludes flood-damaged roads

The County has made improvements in reducing the percent of roadways in the Poor and Below Average categories and significantly raising the number of roads in the Above Average category. Current annual maintenance investments in County mainline roadways is producing stable overall pavement conditions.

Non-Paved Roads

The County maintains 238 centerline miles of gravel surface and 184 miles of native surface roads. The distinction on surface type is that gravel roads have been improved by treating with a manufactured aggregate material, whereas native surface roads have not. Non-paved roads require regular maintenance, including, but not limited to:

- Grading
- Dust treatment
- Resurfacing with gravel
- Base treatments and aggregate maintenance
- Mowing
- Drainage
- Snow and ice control

A non-paved road’s condition can change significantly throughout the year so field personnel monitor conditions and schedule maintenance operations as needed. All non-paved roads are graded at least once each year starting in the spring. Higher traffic roads may be graded multiple times per year. Several factors affect how quickly a road’s condition deteriorates such as traffic volume, traffic speed, quality of surface material, number of trucks, weather, and if a dust suppressant or stabilization chemical has been applied. Non-paved road conditions are formally inspected annually on a scale of A to F much like a school report card. These inspections aid in tracking how the average condition of the non-paved road network changes from year to year.

Non-Mainline Roads Maintained by the County

There are 227 miles of non-mainline roads, both paved and non-paved, in Larimer County that the County provides a basic level of maintenance as outlined below. Most of these roads are generally in subdivisions or part of a PID.

Paved roads receive surface maintenance which consists only of crack sealing, chip sealing, some drainage, signs, and limited structural patching. Paved road maintenance does not include curb and gutter, cross pans, or aprons.

Non-paved roads are graded, but there is no added gravel; crews only work with what is existing. There is less maintenance applied to these roads as compared to the mainline County roads.

Paved Roads

There are approximately 84 miles of paved subdivision roads (4.5 miles of which are in a PID). Subdivision roads are maintained by the County through various agreements. These agreements are sometimes ad hoc, and sometimes formal, and are not maintained in a central database. Long-term planning and funding of complete life cycle costs, such as overlay or reconstruction, for these roads has not occurred.

Non-Paved Road in Unincorporated Larimer County



Non-Paved Roads

There are approximately 21 miles of non-paved roads that receive County maintenance. Half of these non-paved roads use PIDs to provide enhanced levels of maintainance which are in subdivisions, approximately 10.5 miles. These roads are maintained by the County through various agreements.

Forest Service Roads

The County provides limited maintenance for 121 miles of US Forest Service roads. The County is not directly paid to maintain these roads but is credited in the Highway User Trust Fund (HUTF) reporting.

Non-Mainline Roads Not Maintained by the County

There are approximately 325 miles of public roadways within County boundaries that are not maintained by Larimer County. Of that, 120 miles are paved and 205 miles are unpaved.

Subdivision Roads

Subdivision roads make up 245 miles, or 75 percent, of the roads not maintained by the County. Most of these roads (161 miles) are not paved. They do not receive any County maintenance; as a result, many are not maintained. Those that are maintained by the property owners rely on PIDs to pay for maintenance.

With 60 percent of subdivision roadways lacking a reliable mechanism for long-term maintenance, the County anticipates that the overall condition rating of subdivision roads may continue to decline. In general, these roadways fall into one of three categories, described below.

1. Roadway segments consistently maintained by a Home Owners Association, which is a relatively small percentage of the 245 miles.
2. Roadway segments not being maintained, resulting in a shortened service life for both asphalt pavement and gravel surfaces. This results in a growing backlog of deferred maintenance.
3. Roadway segments maintained by a PID, which currently includes approximately 40 percent of the 245 miles. PIDs are formed by a vote of the subdivision homeowners who agree to tax themselves to cover costs for improvements and maintenance of the roadways in their designated district. The County provides staff resources to assist with the development and oversight of the PIDs. There are 54 PIDs in Larimer County that cover 98 miles of roadway as of 2016. Some PIDs were formed to enhance current County maintenance, representing 15 miles of the total.

The County is developing a potential solution to the challenging issue of subdivision roadway maintenance, which many counties within Colorado also experience. Part of the solution involves implementing a planning process to proactively identify subdivisions that are willing to establish an improvement district to fund roadway improvements and address deteriorating roadway or pavement/drainage conditions within their neighborhood. The second part of the solution involves establishing a reliable loan-based funding process to address capital needs, while minimizing the overhead expenses associated with borrowing costs. The County is currently working with a financial advisor to develop alternative loan mechanisms for these needs.

Bridges

Larimer County is responsible for the maintenance of approximately 200 major (or qualifying) structures and approximately 477 minor structures. Major structures are greater than 20 feet in length. The major structures are inspected every two years, if not more frequently, by CDOT consultants. The purpose of the inspection is to identify bridges that are structurally deficient, functionally obsolete, or of a low sufficiency, as determined through a rating system. The definition of these categories by the Federal Highway Administration (FHWA) is as follows:



Structurally Deficient (SD): Bridges are considered structurally deficient if significant load-carrying elements are found to be in poor or worse condition due to deterioration and/or damage, or if the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to the point of causing intolerable roadway traffic interruptions. Structurally deficient bridges are not inherently unsafe.

Functionally Obsolete (FO): Functionally obsolete is a status used to describe a bridge that is no longer by design functionally adequate for its task. Reasons for this status include that the bridge does not have enough lanes to accommodate the traffic flow or it may not have space for emergency shoulders. Functionally obsolete does not represent anything of a structural nature. A functionally obsolete bridge may be perfectly safe and structurally sound, but may be the source of traffic jams or may not have a high enough clearance for an oversized vehicle.⁸

⁸ <http://nationalbridges.com/guide-to-ratings>

Sufficiency Rating: The sufficiency rating of an individual bridge, on a scale of 0 to 100, is based on the structural adequacy and safety, essentiality for public use, and serviceability and functional obsolescence of the bridge. The sufficiency rating considers multiple aspects of a structure and its level of performance and is the basis for establishing eligibility and initial priority for replacement and rehabilitation of bridges under the Highway Bridge Replacement and Rehabilitation Program. In general, a low sufficiency rating for a structure will place that structure at a higher priority for repairs or replacement.

Load Posting: Load posting restricts the weight of vehicles that can cross major or minor structures to levels below legal loads. Load posting practices include the identification of structures to post for load, the evaluation of safe load capacities of these structures, and the implementation of restrictions on vehicle weights at structures.

Major structures with a sufficiency rating of 50 or lower, **and** which are classified as either functionally obsolete or structurally deficient, are eligible to receive federal funds for structure replacement. Those structures with a rating between 50 and 80, **and** classified as functionally obsolete or structurally deficient, are eligible for rehabilitation funds administered by CDOT with a possibility of replacement on a case-by-case basis.

By comparison to the state and national inventory, Larimer County is doing very well with structurally deficient bridges, as shown in Table 9.

Table 9. Condition of Major Structures by Category

Agency	Functionally Obsolete	Structurally Deficient	Load Posted	< 50 Sufficiency
Larimer County	9.5%	2.0%	6.0%	12.5%
State of Colorado	9.8%	5.7%	N/A	N/A
National	13.6%	9.1%	N/A	N/A

Source: Larimer County (County), 2015 National Bridge Inventory (State & National)
Includes structures in Table 10 and Table 12

Major Structures

Of the 200 structures with a span of more than 20 feet in length, 42 have been identified as needing improvement (21 percent) based on the 2015 inspection report. In addition, one major structure has been identified as needing improvement in response to damage sustained during the 2013 floods. Further, 17 minor structures sustained flood damage and will be re-classified as major structures following their reconstruction. See the subsequent section – Flood-Damaged Structures – for more information on these 18 bridges.

Table 10 shows the 42 major structures that need improvement unrelated to flood damage. Of these, five are structurally deficient, eight are functionally obsolete, and nine are load posted. The remaining structures are identified for improvements based on sufficiency rating, site conditions, safety, or being part of a larger overall construction or reconstruction project, or a combination of the preceding reasons. Larimer County estimates the total cost of replacement or rehabilitation of structures in Table 10 to be \$44.4 million.

Major structures in Larimer County have expected useful lives ranging from 30 to 75 years depending on the structure type, material, and level of use. 23 percent of the County’s major structures have already surpassed their expected useful lives, and another 24 percent have reached between 75 and 100 percent

of their expected useful lives. As the County’s infrastructure continues to age, maintenance and full replacement of major structures has become a top priority of the County.

The Larimer County Strategic Plan (2013-2018) has the following goal: By the end of 2020, 100 percent of the publicly owned and maintained bridges, on mainline collector or arterial roads over 200 ADT, in unincorporated Larimer County will be structurally sufficient.

There were five bridges identified through this analysis. Two bridge projects have been completed. The remaining bridges prioritized through the Strategic Plan are already in the design or construction phase and not included in Table 10. These bridge improvements are estimated to cost \$6 million and are programmed for reconstruction in the next few years:

- LR18-0.4-23E: Over Handy Ditch, November 2017 - February 2018
- LR19E-0.5-20: Over Big Thompson River, January - June 2019
- LR9-0.4-56: Over Larimer Canal, January - June 2018

The Bridge Structure Number in Table 10 identifies the structure location. The first number corresponds to the County road on which the structure is located; the second number corresponds to the miles north for odd numbered roads or east for even numbered roads of the third number, which is the nearest intersection. The second number could have an ‘S’, south, or ‘W’, west, if there is no other intersection to reference. For example, bridge structure 15-0.9-4 is located on CR 15 approximately 0.9 miles north of CR 4. Sometimes, the third number is preceded by an ‘I’ for Interstate or an ‘S’ for State or US Highway where these roadway facilities are closer to the structure than a County road. An ‘A’ on the end of the Bridge Structure Number indicates that it has already been replaced once since its original construction.

Figure 11 shows the locations of the 41 bridges listed in Table 10.

Table 10. Major Structures – Highest Priority for Replacement or Rehabilitation

Bridge Structure No.	County Road	Crossing	Sufficiency Rating	Reason for Needing Improvement	Estimated Cost
LR66-0.3-9	CR 66	Boxelder Creek	99.0	Site Conditions	\$500,000
LR17-0.5-S287	CR 17	Terry Lake Inlet	49.8	Sufficiency Rating	\$500,000
LR70-0.1-15	CR 70	North Poudre Canal	78.4	Safety & Tied to Construction Project	\$500,000
LR70-0.6-17-A	CR 70	North Poudre Canal	76.6	Safety & Tied to Construction Project	\$500,000
LR70-0.0-13	CR 70	North Poudre Canal	90.1	Safety & Tied to Construction Project	\$500,000
LR70-0.2-9	CR 70	North Poudre Canal	93.8	Safety & Tied to Construction Project	\$500,000
LR11H-0.3-S402	CR 11H	Big Thompson River	76.0	Functionally Obsolete	\$3,000,000
LR45E-1.8-S287	CR 45E	Dale Creek Tributary	44.4	Structurally Deficient	\$400,000
LR45E-0.2-S287	CR 45E	Dale Creek	47.0	Structurally Deficient & Load Posted	\$1,500,000
LR45E-1.0-S287	CR 45E	Dale Creek Tributary	50.4	Structurally Deficient & Load Posted	\$400,000
LR76H-1.0-37	CR 76H	North Fork Cache la Poudre River	53.2	Structurally Deficient	\$1,000,000

Table 10. Major Structures – Highest Priority for Replacement or Rehabilitation

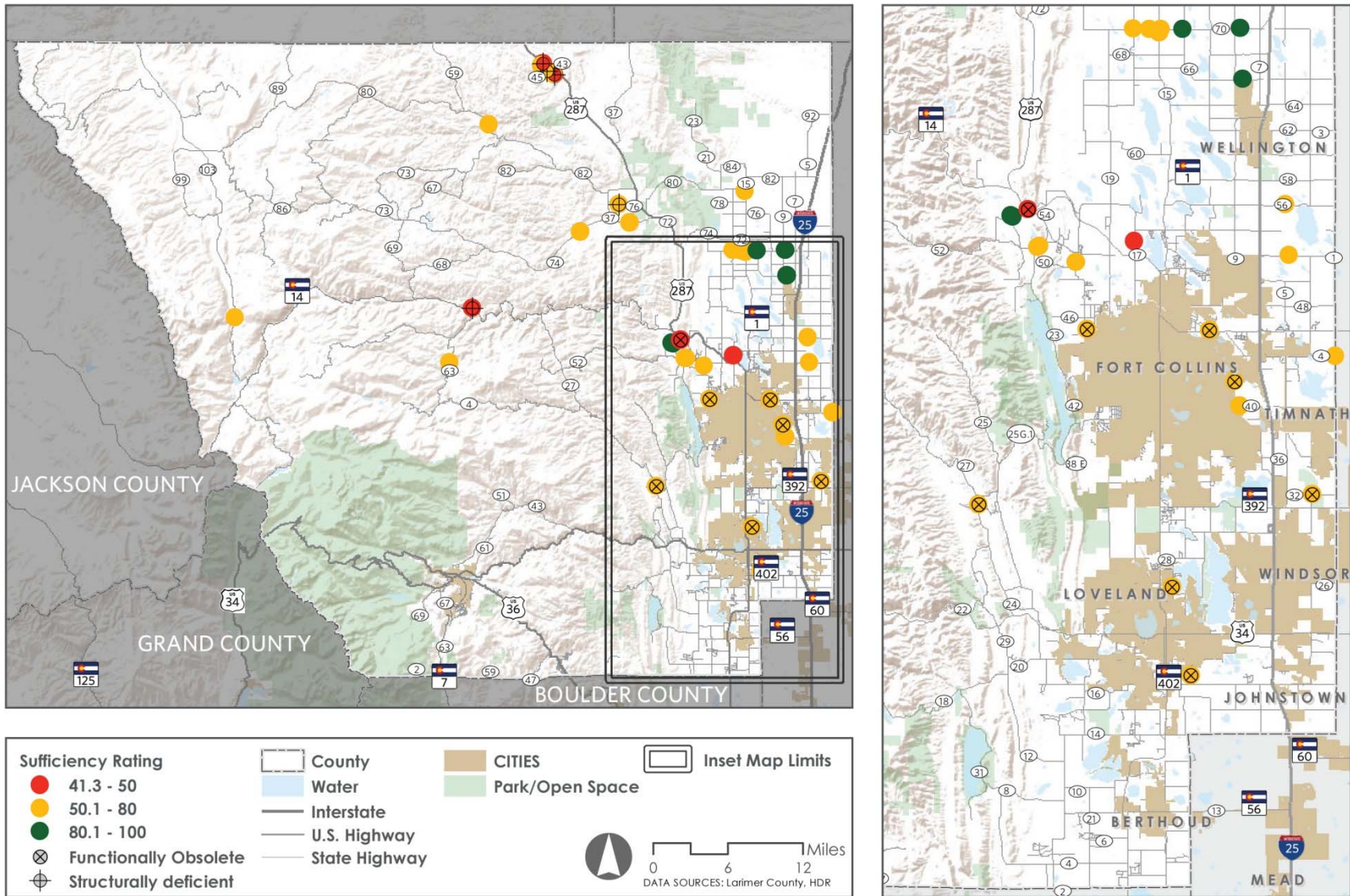
Bridge Structure No.	County Road	Crossing	Sufficiency Rating	Reason for Needing Improvement	Estimated Cost
LR56-0.2-S287	CR 56	Larimer County Canal	44.4	Functionally Obsolete	\$800,000
LR45E-1.2-S287	CR 45E	Dale Creek Tributary	56.6	Sufficiency Rating	\$400,000
LR82-0.2-15	CR 82	Rawhide Creek	55.5	Sufficiency Rating	\$1,000,000
LR74E-9.9-68C	CR 74E	South Lone Pine Creek	63.5	Sufficiency Rating	\$500,000
LR52-1.2-I25	CR 52	Larimer County Canal	63.0	Sufficiency Rating	\$1,000,000
LR74E-1.9-37	CR 74E	North Fork Cache la Poudre River	64.2	Sufficiency Rating	\$2,500,000
LR21C-0.2-50E	CR 21C	Cache la Poudre River	64.9	Sufficiency Rating	\$3,000,000
LR46E-1.1-13	CR 46E	Dry Creek	66.2	Functionally Obsolete	\$400,000
LR13E-0.3-24E	CR 13E	Exchange Ditch - Horseshoe	66.3	Functionally Obsolete	\$1,500,000
LR27-0.1-32C	CR 27	Buckhorn Creek	65.7	Functionally Obsolete	\$2,000,000
LR63E-11.8-44H	CR 63E	Cache la Poudre River	41.3	Structurally Deficient	\$3,000,000
LR40-0.2-9	CR 40	Fossil Creek Residential Inlet	78	Sufficiency Rating & Tied to Construction Project	\$500,000
LR46-0.1-21	CR 46	Pleasant Valley & Lake Canal	65.6	Functionally Obsolete	\$400,000
LR32E-0.1-3	CR 32E	Cache la Poudre River	66	Functionally Obsolete	\$3,000,000
LR45E-1.6-S287	CR 45E	Dale Creek Tributary	66.8	Sufficiency Rating	\$400,000
LR45E-0.4-S287	CR 45E	Dale Creek Tributary	67.2	Load Posted	\$400,000
LR45E-1.3-S287	CR 45E	Dale Creek Tributary	67.6	Load Posted	\$400,000
LR15-0.8-78	CR 15	Boxelder Creek	56.0	Sufficiency Rating	\$2,500,000
LR15-0.9-68	CR 15	North Poudre Canal	68.8	Sufficiency Rating	\$500,000
LR42-0.0-9	CR 42	Fossil Creek Residential Inlet	69.9	Functionally Obsolete	\$400,000
LR56-1.1-I25	CR 56	Larimer County Canal	58.1	Load Posted	\$1,000,000
LR103-6.8-S14	CR 103	Laramie - Poudre Canal	77.9	Load Posted	\$800,000
LR52E-0.1-23	CR 52E	Cache la Poudre River	61.4	Sufficiency Rating	\$3,000,000
LR52E-0.2-23	CR 52E	Cache la Poudre River	58.6	Sufficiency Rating	\$1,500,000
LR17-0.0-70	CR 17	North Poudre Canal	75.1	Load Posted	\$500,000
LR80C-2.6-59	CR 80C	North Fork Cache la Poudre River	76.4	Load Posted	\$1,000,000
LR54E-0.7-27E	CR 54E	Pleasant Valley & Lake Canal	90.4	Load Posted	\$500,000
LR25E-1.3-52E	CR 25E	Pleasant Valley & Lake Canal	87.1	Load Posted	\$500,000

Table 10. Major Structures – Highest Priority for Replacement or Rehabilitation

Bridge Structure No.	County Road	Crossing	Sufficiency Rating	Reason for Needing Improvement	Estimated Cost
LR63E-4.7-44H	CR 63E	Little Beaver Creek	75.6	Load Posted	\$500,000
LR44-0.0-901	CR 44	Larimer & Weld Canal	75.5	Sufficiency Rating	\$1,200,000

Source: 2015 Inspection Report, Larimer County

Figure 11. Major Structures – Highest Priority for Replacement or Rehabilitation



Minor Structures

Larimer County maintains approximately 476 minor structures with a span between four and 20 feet in length. These structures are inspected by the County every five years and follow the same rating system as the major structures. The minor structures were last inventoried and inspected in 2015-2016.

Table 11 lists the 46 minor structures that, as of 2017, are the highest priority for improvements. 10 percent of minor structures within the County are identified as needing improvements, totaling an estimated \$10.1 million. Of these, 19 are structurally deficient, four are functionally obsolete, and five are load posted. The remaining minor structures listed in Table 11 require improvements due to sufficiency rating, site conditions, flood damage, safety, or phasing out of bridge material, most notably timber bridges.

The naming convention of the Bridge Structure Number is the same as in Table 10, described in the Major Structures section, except that the second number is listed to the hundredth of a mile instead of tenth of a mile.

Table 11. Minor Structures – Highest Priority for Replacement or Rehabilitation

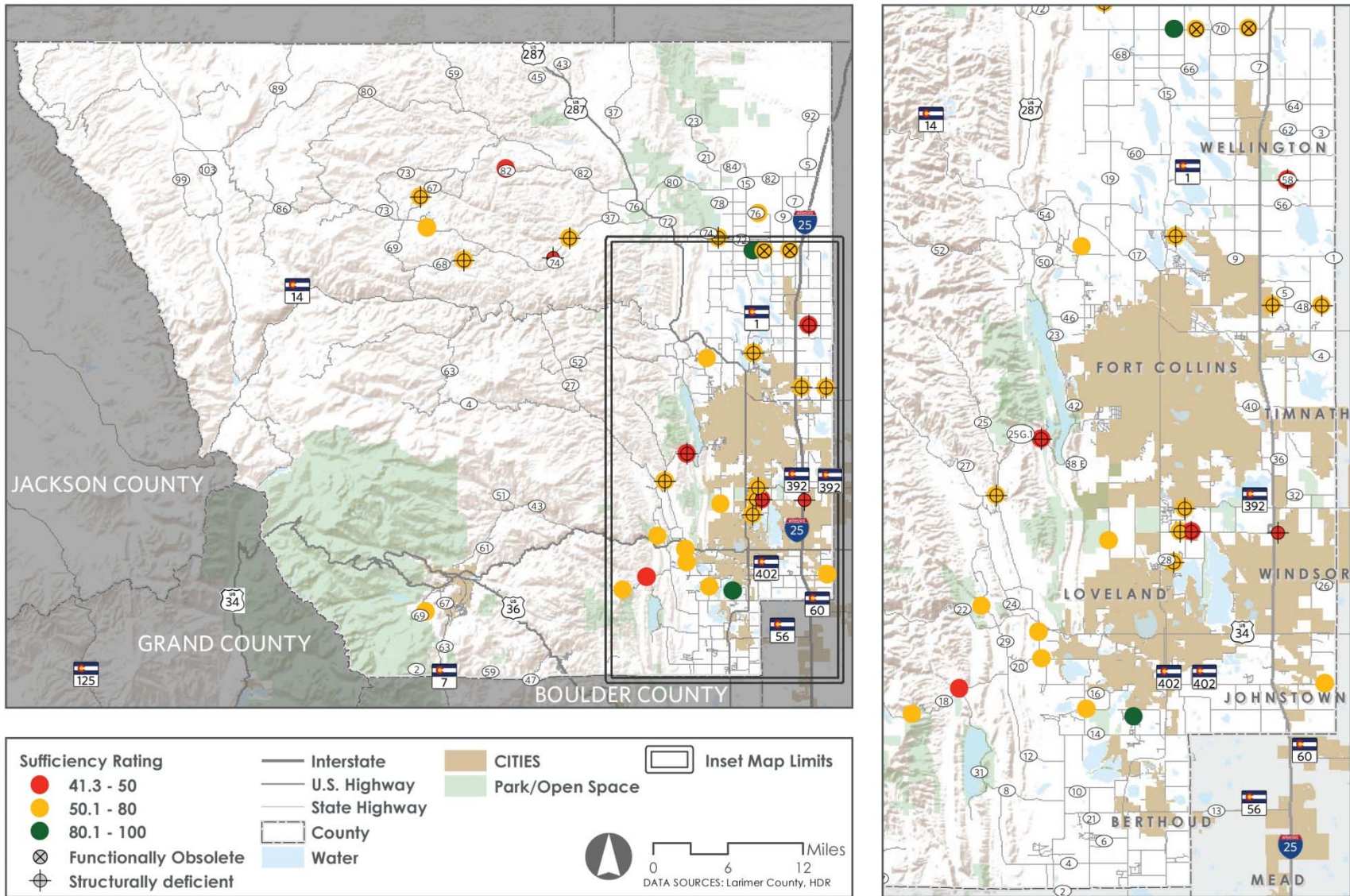
Bridge Structure No.	County Road	Crossing	Sufficiency Rating	Reason for Needing Improvement	Estimated Cost
5-S0.16-70	CR 5	North Poudre Canal	39.3	Structurally Deficient & Load Posted	\$25,000
13-1.09-30	CR 13	Fossil Creek Tributary	57.6	Structurally Deficient	\$50,000
8E-0.00-27E	CR 8E	Dry Creek	57.7	Functionally Obsolete	\$400,000
74E-6.54-68C	CR 74E	Unnamed Drain	30.1	Structurally Deficient	\$240,000
74E-8.50-68C	CR 74E	Unnamed Drain	53.3	Structurally Deficient	\$900,000
74E-1.95-67J	CR 74E	Unnamed Drain	61.9	Culvert	\$160,000
74E-2.15-67J cul	CR 74E	Unnamed Drain	N/A	Culvert	\$125,000
29-1.03-S34	CR 29	Big Thompson Tributary	77.9	Safety	\$300,000
17-0.70-14	CR 17	Home Supply Ditch	90.0	Phasing out Material & Part of Construction Project	\$600,000
30-0.18-I25	CR 30	Louden Extension Ditch	41.0	Structurally Deficient	\$75,000
82E-3.37-67J	CR 82E	Coyote Creek	41.3	Sufficiency Rating	\$75,000
58-1.14-I25	CR 58	Boxelder Creek	43.8	Structurally Deficient	\$1,500,000
18E-W0.04-31	CR 18E	Local Drainage	45.0	Sufficiency Rating	\$25,000
30-0.90-13S	CR 30	Louden Ditch	48.3	Structurally Deficient & Load Posted	\$75,000
25G-0.14-38E	CR 25G	Local Drainage	50.0	Structurally Deficient	\$200,000
68C-4.60-69	CR 68C	Elkhorn Creek Tributary	52.8	Structurally Deficient	\$50,000
72-0.89-21	CR 72	North Poudre Canal	52.9	Structurally Deficient	\$50,000
70-0.58-9	CR 70	North Poudre Canal.	53.2	Functionally Obsolete & Load Posted	\$500,000

Table 11. Minor Structures – Highest Priority for Replacement or Rehabilitation

Bridge Structure No.	County Road	Crossing	Sufficiency Rating	Reason for Needing Improvement	Estimated Cost
70-0.49-13SB	CR 70	Boxelder Creek Diversion	56.0	Functionally Obsolete & Load Posted	\$500,000
70-0.61-15	CR 70	North Poudre Canal	96.9	Safety	\$500,000
16-0.10-21	CR 16	South Side Ditch	55.5	Load Posted	\$400,000
15-0.10-905	CR 15	New Ish Ditch	58.6	Functionally Obsolete	\$400,000
21A-0.00-52B.9	CR 21A	Little Cache la Poudre Ditch	60.7	Sufficiency Rating	\$600,000
13E-0.24-52E	CR 13E	Richard’s Lake Inlet	60.7	Structurally Deficient	\$25,000
23H-1.05-20	CR 23H	South Side Ditch	60.8	Sufficiency Rating	\$300,000
103-10.38-80C	CR 103	Maggie Creek	61.3	Structurally Deficient	\$75,000
26H-0.07-13E	CR 26H	Unnamed Drain	62.7	Structurally Deficient	\$75,000
21F-.3-0.07-18	CR 21F	Buckingham Ditch	62.8	Structurally Deficient	\$25,000
69B-S1.04-S66	CR 69B	Aspen Brook	66.0	Sufficiency Rating	\$300,000
18-0.60-3	CR 18	Hillsborough Ditch	67.0	Sufficiency Rating	\$300,000
67J-2.65-74E	CR 67J	Columbine Creek	67.0	Structurally Deficient	\$25,000
19-0.66-28	CR 19	Local Drainage	68.0	Sufficiency Rating	\$25,000
18E-W3.18-31	CR 18E	Local Drainage	68.9	Sufficiency Rating	\$75,000
18E-W3.43-32	CR 18E	Local Drainage	68.9	Sufficiency Rating	\$50,000
18E-W3.92-33	CR 18E	Local Drainage	68.9	Sufficiency Rating	\$25,000
2H-0.77-S7	CR 2H	Alpine Brook	69.0	Sufficiency Rating	\$25,000
48-0.51-I25	CR 48	Boxelder Creek	69.5	Structurally Deficient	\$75,000
48-0.47-3	CR 48	Local Drainage	69.7	Structurally Deficient	\$25,000
25E-3.74-24H	CR 25E	Redstone Creek Tributary	69.9	Structurally Deficient	\$25,000
76-1.08-15	CR 76	North Poudre Canal	70.0	Sufficiency Rating	\$75,000
30-0.80-S287	CR 30	Louden Ditch	77.7	Structurally Deficient	\$500,000
20-0.08-23H	CR 20	Unnamed Ditch	78.1	Site Conditions	\$300,000

Source: 2015 Inspection Report, Larimer County

Figure 12. Minor Structures – Highest Priority for Replacement or Rehabilitation



Flood-Damaged Structures

In September 2013, the County experienced severe flooding that damaged many structures. The recovery process is ongoing with funding from the Federal Emergency Management Agency (FEMA) and FHWA.

Table 12 shows a list of structures that are currently undergoing construction or have remaining needs. Only Bridge Structure Number 15-0.9-4 across the Little Thompson River is a major structure. The remaining flood-damaged bridges are classified as minor structures. Once these structures are rebuilt, all will be classified as major structures.

Table 12 shows that one of the flood-damaged bridges is functionally obsolete.

Table 12. Structures with Flood Damage

Bridge Structure No.	Location	Sufficiency Rating	Reason for Needing Improvement	Estimated Cost
15-0.9-4	Little Thompson River	72.5	Functionally Obsolete & Flood Damage	\$3,300,000
47-S0.89-S36-A	West Fork Little Thompson River	74.0	Flood Damage	\$700,000
47-SO.51-S36-A	West Fork Little Thompson River	74.0	Flood Damage	\$700,000
47-SO.41-S36-A	West Fork Little Thompson River	74.0	Flood Damage	\$700,000
47-SO.07-S36	West Fork Little Thompson River	0.0	Flood Damage	\$700,000
44H-12.38-63E	Buckhorn Creek	89.7	Flood Damage	\$1,000,000
44H-14.46-63E-A	Buckhorn Creek	82.0	Flood Damage	\$1,000,000
44H-14.71-63E	Buckhorn Creek	84.6	Flood Damage	\$1,000,000
44H-16.06-63E	Buckhorn Creek	96.9	Flood Damage	\$1,000,000
44H-16.28-63E-A	Sheep Creek	82.0	Flood Damage	\$1,000,000
44H-16.41-63E	Buckhorn Creek	82.0	Flood Damage	\$1,000,000
44H-17.40-63E	Stove Prairie Creek	96.7	Flood Damage	\$1,000,000
44H-17.72-63E	Local Drainage	90.4	Flood Damage	\$1,000,000
25E-2.20-38E	Redstone Creek	N/A	Flood Damage	\$240,000
25E-2.67-38E	Redstone Creek	N/A	Flood Damage	\$240,000
25E-4.42-38E	Redstone Creek	N/A	Flood Damage	\$240,000
25E-5.02-38E	Redstone Creek	N/A	Flood Damage	\$240,000
25E-5.70-38E	Redstone Creek	N/A	Flood Damage	\$240,000

Source: 2015 Inspection Report, Larimer County

MAINTENANCE SUMMARY

Guiding Principle



Maintain the transportation network to optimize investment in the transportation infrastructure.

Existing & Future Conditions

- **\$10 million of the County’s \$23 million transportation budget goes to Capital Expansion and Improvement.**
- **2% of major bridges are *structurally deficient* and 9.5% are *functionally obsolete***
- **The County is improving all *structurally deficient* major bridges on mainline county roads per the Strategic Plan.**

ROADWAYS. Roads in the County are split into three categories for maintenance purposes:

- Mainline County roads: owned and maintained by the County
- Non-mainline County roads maintained by the County: maintained, but not owned, by the County
- Non-mainline County roads not maintained by the County: neither maintained nor owned by the County

Since 2006, mainline County road conditions have improved dramatically. Roads in the “Poor” condition category have decreased from five percent to less than one percent, and roads in the “Above Average” and “Very Good” categories have increased from 66 percent to 81 percent.

BRIDGES. The County maintains over 200 major structures and approximately 477 minor structures. Only two percent of major structures in the County are structurally deficient, compared to a national average of over nine percent. The County estimates \$54.5 million in high priority repairs and rehabilitations for both major and minor structures. An additional 18 structures are in need of repairs or reconstruction due to flood damage.

What maintenance work has the County planned for roads & bridges?

Goals identified through the planning process to address maintenance include:

- A. *Maintain the County mainline paved roadway system to an overall pavement condition index of 70 or better.*
- B. *Maintain the County mainline non-paved roadway system.*
- C. *Maintain bicycle and pedestrian facilities within the County mainline right-of-way.*
- D. *Repair, rehabilitate, or replace major and minor bridge structures based on the bridge inspection report and evaluation criteria.*

The County will continue improving the condition of mainline County roads through its current maintenance program. Early, preventive maintenance has a lower cost than more extensive repairs and reconstruction. The County aims to provide cost-effective preventive maintenance at the right time by closely monitoring roadway conditions.

Larimer County Strategic Plan (2013-2018): **By the end of 2020, 100 percent of the publicly owned and maintained bridges, on mainline collector or arterial roads over 200 ADT, in unincorporated Larimer County will be structurally sufficient.**

The County has programmed for reconstruction three remaining bridges that fall into this category. Construction will be completed in the next few years.



Multimodal

Multimodal

Guiding Principle 3: Diversify the transportation network by considering the development and use of alternative transportation modes during the planning and design process of each transportation project.

Goals and strategies to expand transportation options in Larimer County, including bicycle and pedestrian facilities and transit:

- A. Provide road rights-of-way and cross sections that are wide enough to accommodate all identified users and functions (autos, transit vehicles, pedestrians, and bicyclists), as practical and feasible.
 - i. To accommodate bicycles and pedestrians, the paved cross section should be consistent with design standards depending on terrain and other limitations.
- B. Consider bicycle facilities, such as wide shoulders and bicycle lanes, on roadways that experience high bicycle demand and would provide continuity in the regional bicycle network, where practical.
- C. Consider pedestrian crossing improvements where conditions warrant.
- D. Coordinate with transit providers to increase the accessibility of transit services in unincorporated Larimer County.

Bicycles

Existing Conditions

Bikeway systems implemented throughout Larimer County include a wide range of bicycle facilities, as described below and shown in Figure 13.

Roadways with Shoulders

The County recommends a minimum five-foot shoulder for bicyclists, although six-foot shoulders are preferred where practical and feasible. This aligns with CDOT’s best practice of providing a minimum of four-foot shoulders for bicyclists, and six or eight feet where there is need for greater width, such as on steep inclines or areas with high traffic volumes. Section 14.1.5 of the CDOT *Roadway Design Guide*⁹ includes more detailed guidance on whether shoulder widths should be four, six, or eight feet for bicyclists depending on roadway conditions. Figure 13 shows an inventory of shoulder widths on major roads within the County. A large number of routes near the metropolitan areas around Fort Collins and Loveland have shoulders wider than four feet. Many of the mountainous routes, however, have shoulders narrower than four feet. Construction of additional shoulder width can often be very costly due to terrain, drainage and other features adjacent to rural roadway pavement.

68% of survey respondents bicycle for recreation very often or sometimes

-Larimer County Transportation Assessment, October-November 2015

⁹ https://www.codot.gov/business/designsupport/bulletins_manuals/roadway-design-guide/ch14

Bicycle Lanes

Lanes are designated by pavement markings on roadways for bicycles. Standard County road bicycle lanes have a minimum width of five feet, with six feet being the preferred width. Currently, there are approximately 40 miles of bicycle lanes in unincorporated Larimer County, most of which are close to the urban areas of Fort Collins and Loveland.

Regional Trails

Regional trails are off-street paved or non-paved trails used exclusively for bicyclists and pedestrians. The Poudre River Trail is one of the designated regional trails in Larimer County. This paved trail runs alongside the Poudre River east of Fort Collins by the Colorado State University (CSU) Environmental Learning Center all the way to Bellvue, Colorado.

While none of the regional trails identified in the *Larimer County Open Lands Master Plan* (February 2015) are completed, there are sections on several of the corridors that are built or have funding to be built. These include:

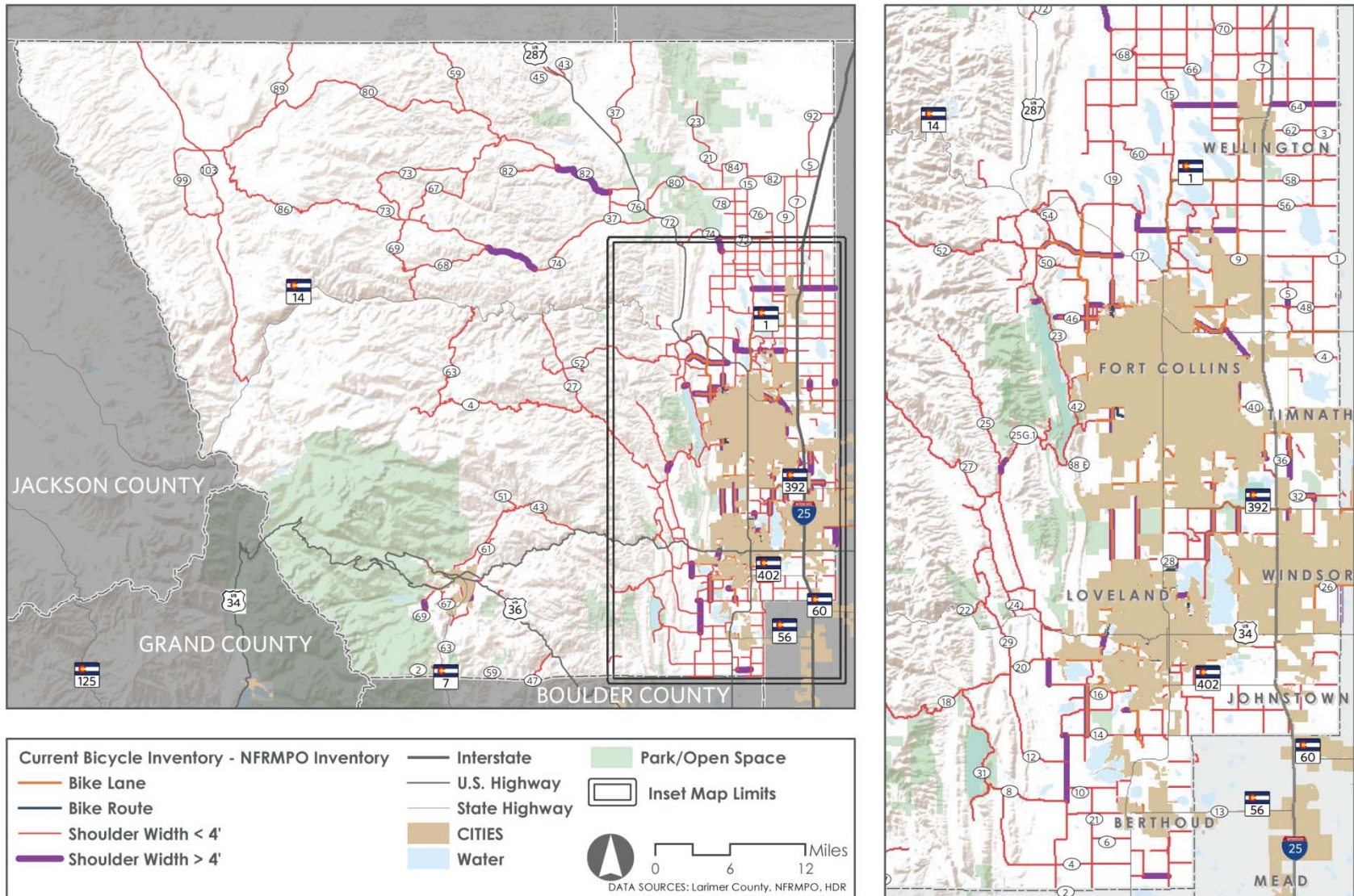
Poudre River Trail



- Poudre River Trail
- Front Range Trail
- Longview or the BNSF Fort Collins/Berthoud Trail
- North Loveland/Windsor Trail

Funding for the expansion of the Poudre River Trail, Front Range Trail, and Longview Trail is programmed within the next five years.

Figure 13. Existing Bicycle Facilities



Other Popular Bicycle Routes

Popular bicycle routes include:

- Pinewood Reservoir/Carter Lake Loop – 22 miles – includes CR 31, CR 8E, CR 23, CR 12, and CR 29 – Starts and ends at Pinewood Reservoir
- Horsetooth Reservoir/Centennial Drive – 19.5 mile loop – Start/finish at the corner of Harmony and Taft Hill – includes CR 38E, Centennial Drive, Rist Canyon Road, CR 54G, and Overland Drive
- Owl Canyon – 45 mile loop – includes CR 9, CR 70, CR 15, and CR 54 – Start/finish in Fort Collins
- Rist Canyon – up and back – uses CR 52 and some continuation through CR 27 into Masonville and back to the Horsetooth Reservoir area
- All three Scenic Byways identified in the Introduction section of this *Transportation Master Plan*.

There are a number of other popular recreational routes in the County. Strava (a popular bicycle route tracking application) provides further insight into where road bicyclists and mountain bikers currently ride within the County. Strava bicycle counts were overlaid on the street network to produce Figure 14, which highlights moderate and high bicycling activity recorded by Strava. It is important to note that these high-demand locations show where recreational bicyclists ride, but do not account for vulnerable user groups, families, and commuters.

If the County conducts a planning effort specific to bicycles, additional outreach would need to be conducted to reach user groups beyond recreational riders and the data provided by Strava.

County Bicycle Resources

Additionally, there are numerous mountain biking trails in Larimer County, all of which fall under the jurisdiction of the Larimer County Department of Natural Resources. Further information about Parks and Open Space Trails can be found here: <http://www.co.larimer.co.us/parks/parkareas.htm>.

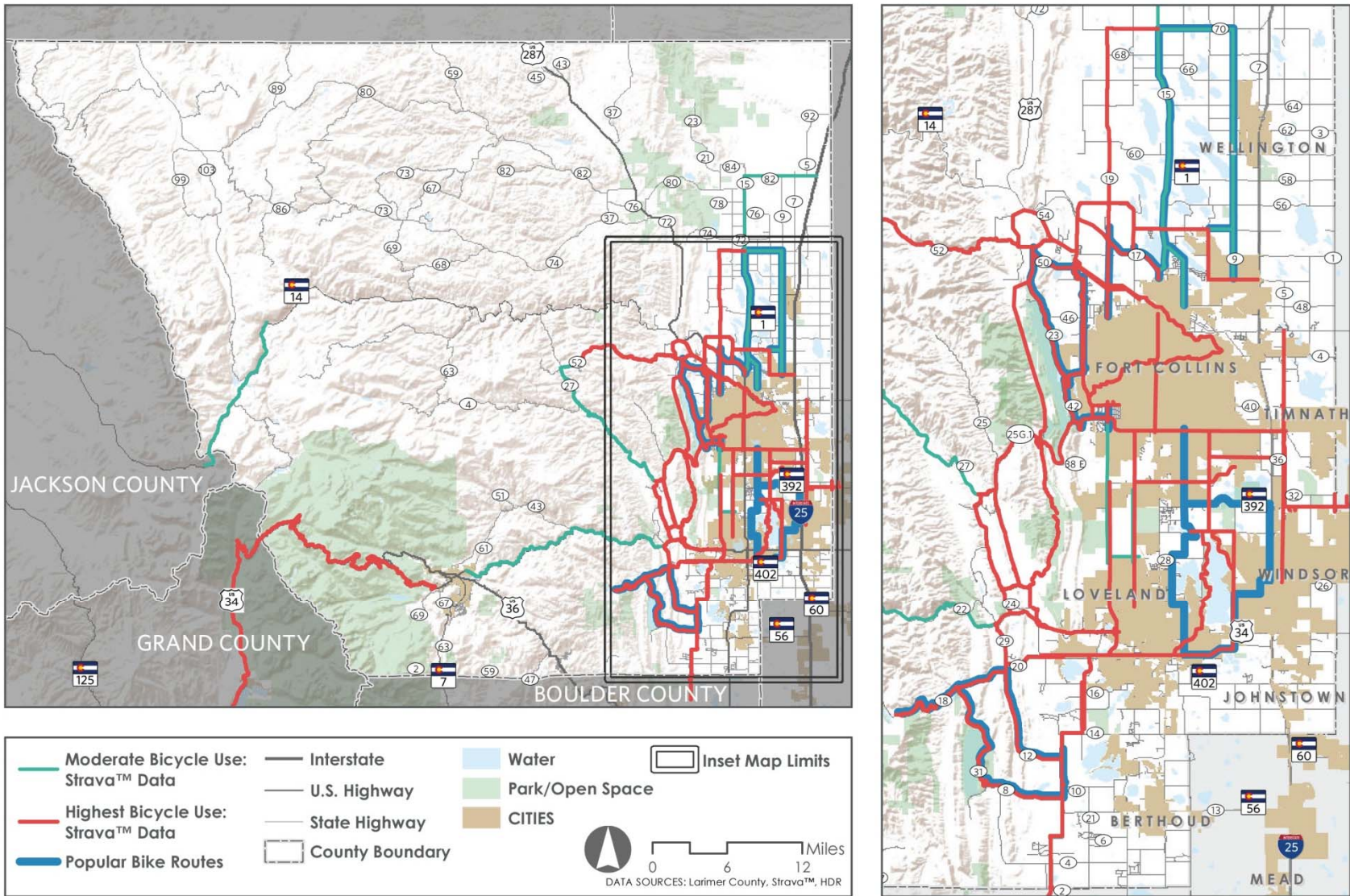
The Bicycle Ambassador Program is a volunteer program in northern Colorado that offers safety education presentations, hosts bicycling events, and provides resources and information about traffic laws to the bicycling community. This program has been successful in enhancing education and safety for bicyclists in Larimer County. Further information can be found here:

<http://bicyclembassadorprogram.org/>.

The websites for Estes Park, City of Fort Collins, City of Loveland, CDOT, and CSU offer detailed bicycle facilities maps for their region. These websites also provide regional bicycling information, such as policies, trail guides, and bicycle resources.

- Estes Park: <http://www.visitestespark.com/things-to-do/outdoor-adventures/biking/>
- City of Fort Collins Bicycling Program (FC Bikes): <http://www.fcgov.com/bicycling/>
- City of Loveland Recreational Trails: <http://www.ci.loveland.co.us/index.aspx?page=242>
- CDOT Bicycle and Pedestrian Program: <https://www.codot.gov/programs/bikeped>
- CSU Bicycle Map: <http://bicycle.colostate.edu/Data/Sites/7/GalleryImages/csu-bike-map-2012corrected.pdf>

Figure 14. Popular Bicycle Routes



Future Conditions

There are two bicycle and pedestrian plans that apply to Larimer County. These are the 2015 CDOT *Statewide Bicycle and Pedestrian Plan*, and the NFRMPO *2016 Non-Motorized Plan* (adopted February 2017).

The CDOT plan provides insight on the future programming and funding of bicycle and pedestrian facilities across the state. The plan is structured around three sections: a vision that includes statewide goals for walking and bicycling, an assessment of existing conditions, and criteria for making funding decisions for walking and bicycling projects. While there are no location-based recommendations in the report, there are identified high-level strategies for increasing walking and bicycling mode share in Colorado. These strategies include:

- Improving corridor bicycle and walking conditions
- Expanding permanent data collection infrastructure (e.g. in-ground or radar counters)
- Enhancing Scenic Byways
- Creating access to public lands
- Providing shared use pathways
- Providing mobility options to underserved populations
- Providing safe active transportation to schools and learning centers
- Providing pedestrian mobility for seniors and disabled populations
- Providing better access to jobs

The NFRMPO *Non-Motorized Plan* identifies 12 regional bicycle corridors within Larimer and Weld Counties, 10 of which are partially or fully within Larimer County. The plan identifies conceptual routing of the corridor, what bicycle infrastructure exists, and what infrastructure investments are needed. Finalized documents with more detail can be found here: <http://nfrmpo.org/bike-ped/#NMP>.

The 10 corridors within Larimer County are the following:

- Little Thompson River
- Big Thompson River
- Great Western/ Johnstown/ Loveland
- North Loveland/ Windsor
- Poudre River Trail
- Front Range Trail (West)
- BNSF Fort Collins/ Berthoud
- Johnstown/ Timnath
- US 34
- Carter Lake/ Horsetooth Foothills Corridor

The NFRMPO *2016 Non-Motorized Plan* also includes an inventory of existing facilities within the MPO's jurisdiction. Figure 15 shows the future regional routes identified in this effort.

Larimer County has incorporated seven of the 10 regional corridors identified above into the *Larimer County Open Lands Master Plan* (adopted February 2015). Two of these corridors are on the roadway system, and Great Western/ Johnstown/ Loveland, Johnstown/ Timnath, and US 34 were not identified as regional trails in the *Larimer County Open Lands Master Plan*. The *Larimer County Open Lands Master Plan* can be found here: http://www.co.larimer.co.us/openlands/master_plan.pdf.

Within Larimer County, bicycle facilities are planned, installed, and maintained by two separate departments. The Engineering Department is responsible for on-street bicycle facilities, while the Natural Resources Department is responsible for off-road bicycle facilities. Should Larimer County choose to develop a bicycle network of its own, a coordinated effort between the two departments would be required.

The development of a County bicycle network would likely start with an update and additions to the regional bicycle corridors identified by the NFRMPO, as seen in Figure 15. With the addition of heavily used existing routes and Scenic Byways, the County could create a comprehensive prioritization plan for improving bicycle connections based partly on the *Larimer County Open Lands Master Plan* prioritization criteria:

- Consistent with local and state planning
- Outside of growth management areas
- Connects to regional trails and trailheads
- Reaches multiple jurisdictions
- Obstacles to implementation
- Public and agency input

Following the planning process to identify and prioritize a countywide bicycle network, the Engineering and Natural Resources Departments would need to implement these projects. There are a number of best practices for implementing rural and semi-rural bicycle facilities. These best practices can be categorized into infrastructure and policy strategies.

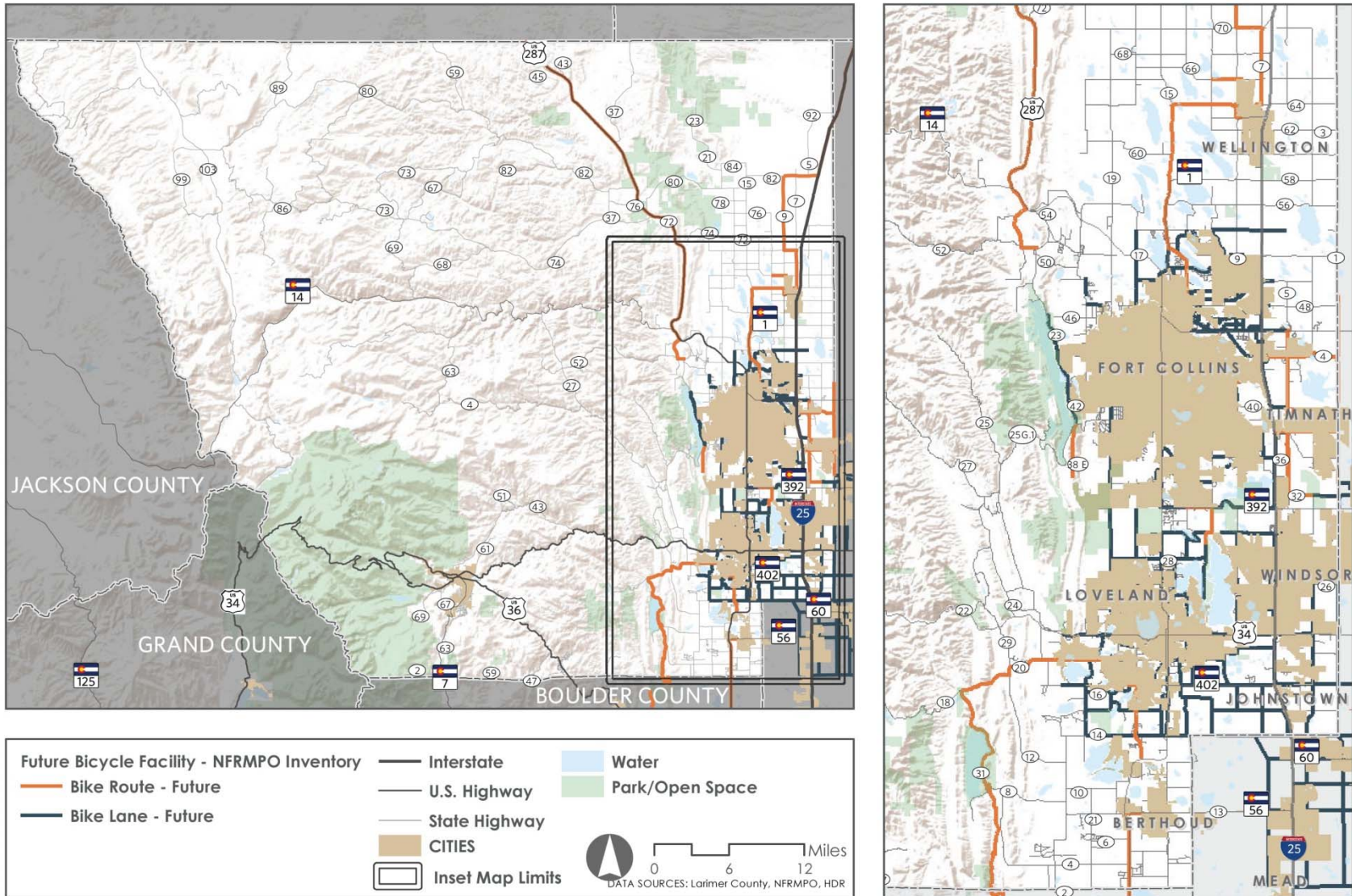
Infrastructure. For infrastructure, the appropriate treatment depends on the character of the facility—determined by traffic volume, surrounding land use, and terrain, among other factors. A comprehensive source for following a robust design process for bicycle and pedestrian facilities is the *CDOT Roadway Design Guide: Chapter 14: Bicycle and Pedestrian Facilities*.¹⁰ Larimer County also has its own bicycle facility design standards, found in Chapter 17 of the *Larimer County Urban Area Street Standards*.¹¹

Policy. Roadway design standards and development standards should support the goal of increasing the number of people walking and bicycling for daily trips or recreation. Roadway design standards should necessitate that projects consider the needs of users walking and bicycling along a project corridor or network under study.

¹⁰ https://www.codot.gov/business/designsupport/bulletins_manuals/roadway-design-guide/ch14

¹¹ http://www.larimer.org/engineering/gmardstds/Ch17_04_01_2007.pdf

Figure 15. Future Regional Bicycle Facilities



Pedestrian

Given the largely rural nature of land within the County's jurisdiction, few pedestrian facilities exist. The County's rural road standards do not generally require curbs, gutters, or sidewalks because of the associated costs and the limited pedestrian activity along these roadways. Where possible, the County includes up to a six-foot shoulder on roadways to accommodate both pedestrians and bicyclists.

The County is beginning to develop an American Disabilities Act of 1990 (ADA) Transition Plan. This plan will identify recommendations to be compliant with the ADA, which prohibits discrimination and ensures equal opportunity for persons with disabilities in employment, state, and local government services, public accommodations, commercial facilities, and transportation. Transportation-specific areas of focus within this plan will include accessible pedestrian signals, curb ramps and sidewalks, and pedestrian trails and amenities within parks and open spaces. The projects that come from this planning effort will be geared toward increasing accessibility, but will also improve the pedestrian environment for all County residents.

Transit

Existing Transit Services

Public and private transit providers operate multiple transit routes throughout Larimer County. Transit services are part of fixed-route and demand-responsive transit systems. While the demand-responsive and paratransit services are geared toward assisting seniors and people with disabilities, the fixed-route systems serve a diverse group of riders. Existing transit systems are described below and shown in Figure 16. More detailed information on each system, such as service statistics, operating characteristics, fleet, and financing, can be found in the *North Front Range 2040 Regional Transportation Plan* and the *2040 Regional Transit Element*, as well as the *Upper Front Range 2040 Regional Transportation Plan*.

NFRMPO also has a comprehensive guide to transit services in the North Front Range:

<http://www.nfrmpo.org/aboutus/MobilityCoordination.aspx>.

City of Fort Collins – Transfort/MAX/FLEX/DAR/Green & Gold

Transfort is a fixed-route service operated by the City of Fort Collins. Transfort has 23 routes, including the MAX, FLEX, and Around the Horn routes through the CSU campus. The MAX Bus Rapid Transit operates on the Mason Corridor in Fort Collins every 10 minutes, serving major activity and employment centers and connecting downtown, CSU and Midtown. The FLEX Regional Service operates on the US 287 corridor from Fort Collins to Longmont. It is funded by a regional partnership and provides a connection between Fort Collins, Loveland, Berthoud, and Longmont with connections to RTD. Around the Horn is a free on-campus shuttle that provides services within CSU. The regular fares for MAX, FLEX and local Transfort routes are \$1.25 per ride with discounts for seniors (60 years and older) and disabled passengers. Transit is free for transfers, youths, and CSU students, faculty, and staff with a valid Ramcard.

The City of Fort Collins also operates Dial-A-Ride (DAR), which is a demand-response and paratransit service. DAR provides door-to-door service to individuals who are eligible under the ADA. The fares are \$2.50 per ride.

In addition, the City of Fort Collins has partnered with the Association of Students of Colorado State University to provide a late-night weekend service between CSU and downtown Fort Collins. This late-night transit has two designated routes, the Green and Gold Routes, that operate from 10:30 P.M. to 2:30 A.M. every Friday and Saturday night. Both routes depart downtown Fort Collins every 15 minutes. Each

ride is \$1.00, or \$0.50 for seniors (60 years and older), passengers with disabilities, or passengers using Medicare, and must be paid in cash. Transfort passes or Ramcards are not accepted for this service.

<http://www.ridetransfort.com/>

City of Loveland Transit (COLT)

COLT has three local fixed-routes. Each route operates hourly Monday through Saturday. The regular fare for a single ride is \$1.25, with discounts for youth and senior passengers. COLT also has paratransit bus services, which offer door-to-door transit within Loveland city limits for persons with disabilities. Senior service is provided to anyone 60 years and older by reservation. The City of Loveland also provides funds for the FLEX Regional Service, operated by Transfort.

<http://www.ci.loveland.co.us/index.aspx?page=175>

Town of Berthoud - Berthoud Area Transportation Service (BATS)

BATS is a demand-response transportation service within the Town of Berthoud that offers scheduled shared rides within the Berthoud service area. BATS operates Monday through Friday from 8:00 A.M. to 4:00 P.M. Fare for a single ride within the Town of Berthoud is \$1.00. For travels between Berthoud and Loveland or Longmont, the fare is \$4.00. For seniors (60 years and older), no fare is required.

Rural Alternative for Transportation (RAFT) is a non-profit transportation project of the charitable organization Berthoud Golden Links, Inc. It is run entirely by volunteers and serves seniors (60 years and older) and persons with disabilities in the Berthoud area. Transportation is provided on weekdays from 8 A.M. to 4 P.M. Riders must first register with RAFT to use the service.

<http://berthoud.org/Town/bats.php>

CDOT – Bustang Interregional Express Bus

Bustang is an Interregional Express Bus offered by CDOT that travels along the I-25 and I-70 corridors. The North Line operates between Fort Collins and Denver Monday through Friday. Bustang coach buses are equipped with restrooms, bicycle racks, free WiFi, power outlets and USB ports. A RamsRoute runs southbound Fridays and northbound Sundays on specified weekends during CSU school sessions. The fare for a single ride between Fort Collins and Denver Union Station or the Denver Bus Center is \$10, with discounts available for seniors (65 years and older), passengers with disabilities, children under 12, and the purchase of multiple tickets.

<http://www.ridebustang.com/>

Rocky Mountain National Park - Shuttle Service

RMNP operates a free shuttle bus service for three different fixed routes throughout the park. The routes connect Estes Park Visitor Center to Bear Lake, with many trailhead and campground stops in between. The shuttle bus service operates late spring, summer, and early fall. The buses do not run during winter months.

https://www.nps.gov/romo/planyourvisit/shuttle_bus_route.htm

Senior Alternatives in Transportation (SAINT) - Shuttle

SAINT is a non-profit organization for which volunteer drivers provide transportation services for seniors (60 years and older) and persons with disabilities in Loveland and Fort Collins. There is no fare required

for this transit service, but donations are appreciated. SAINT operates Monday to Friday by reservation. Transportation is not offered between the two cities or outside of either city's limits. SAINT does not offer services to persons requiring wheelchairs or scooters.

<http://www.saintvolunteertransportation.org/>

Estes Park - Shuttle Service

The Town of Estes Park offers a free shuttle service that operates daily from mid-June to early September. It has five different fixed-routes, including a trolley route, with 63 stops in the Estes Park area. The shuttles operate from 8:00 A.M. to 10:00 P.M., with variations depending on the route. The Estes Park Free Shuttles also offer a connection to the RMNP shuttles.

<https://www.estesparkshuttle.com/>

VanGo™ - Van Pool Program

The VanGo™ van pool program is a shared transit service operated by the NFRMPO. A single van can accommodate up to six people with similar regional commuting times and destinations. Regional pick-up and drop-off locations include: Fort Collins, Loveland, Greeley, Johnstown, Longmont, Boulder, Golden, and the Denver area. The van, fuel, maintenance, and insurance costs are covered by a monthly fee for van pool members. All members must be at least 18 years old, and all drivers must be at least 24 years old. Driving responsibility is shared among the van pool members.

As of February 2015, there were 70 separate van pools serving Larimer County, with 37 available commutes from Fort Collins and 25 available commutes from Loveland. Among the 70 van pools, there are 49 vacant seats available. Fully reserved van pools maintain waiting lists. Registration and information about active van pools can be found on the VanGo™ website.

<http://nfrmpo.org/vango/>

Connecting Health - Van Service

Connecting Health is a free van service provided by Columbine Health Systems that connects five medical centers between Fort Collins and Greeley. The medical centers are the Poudre Valley Hospital, Harmony Campus, Medical Center of the Rockies, Greeley Emergency and Surgery Center, and Greeley Medical Clinic. This service provides free transit for patients with medical appointments at the medical centers. No ride scheduling is required. The vans can accommodate up to 13 riders; however, they do not offer services to persons requiring wheelchairs or scooters.

<http://www.columbinehealth.com/transportation/>

Greyhound - Interregional Bus Service

Greyhound is a private transit provider that offers interregional bus service. The station in Larimer County is located at the Transfort Downtown Transit Center in Fort Collins. Greyhound buses depart from Fort Collins and return from Denver twice daily.

<https://www.greyhound.com/>

Green Ride Colorado - Shuttle Service

Green Ride is a shuttle service that provides transit between the Denver International Airport and Fort Collins, as well as Northern Colorado and Southern Wyoming. There are several pick-up and drop-off

locations located in Fort Collins, Cheyenne, and Laramie; and Green Ride also offers door-to-door services within its service area boundaries. Fares vary depending on the location; door-to-door shuttle services are slightly more expensive. All trips must be reserved in advance.

<http://www.greenrideco.com/>

Future Transit Services

The *Larimer County Strategic Plan* identified an objective to evaluate “the transportation needs and challenges for seniors living in unincorporated Larimer County” and stated that “existing and new options for addressing those needs and challenges will be identified, prioritized, and implemented.” Larimer County is currently developing a senior transportation needs assessment in response to this objective that will be completed in 2017.

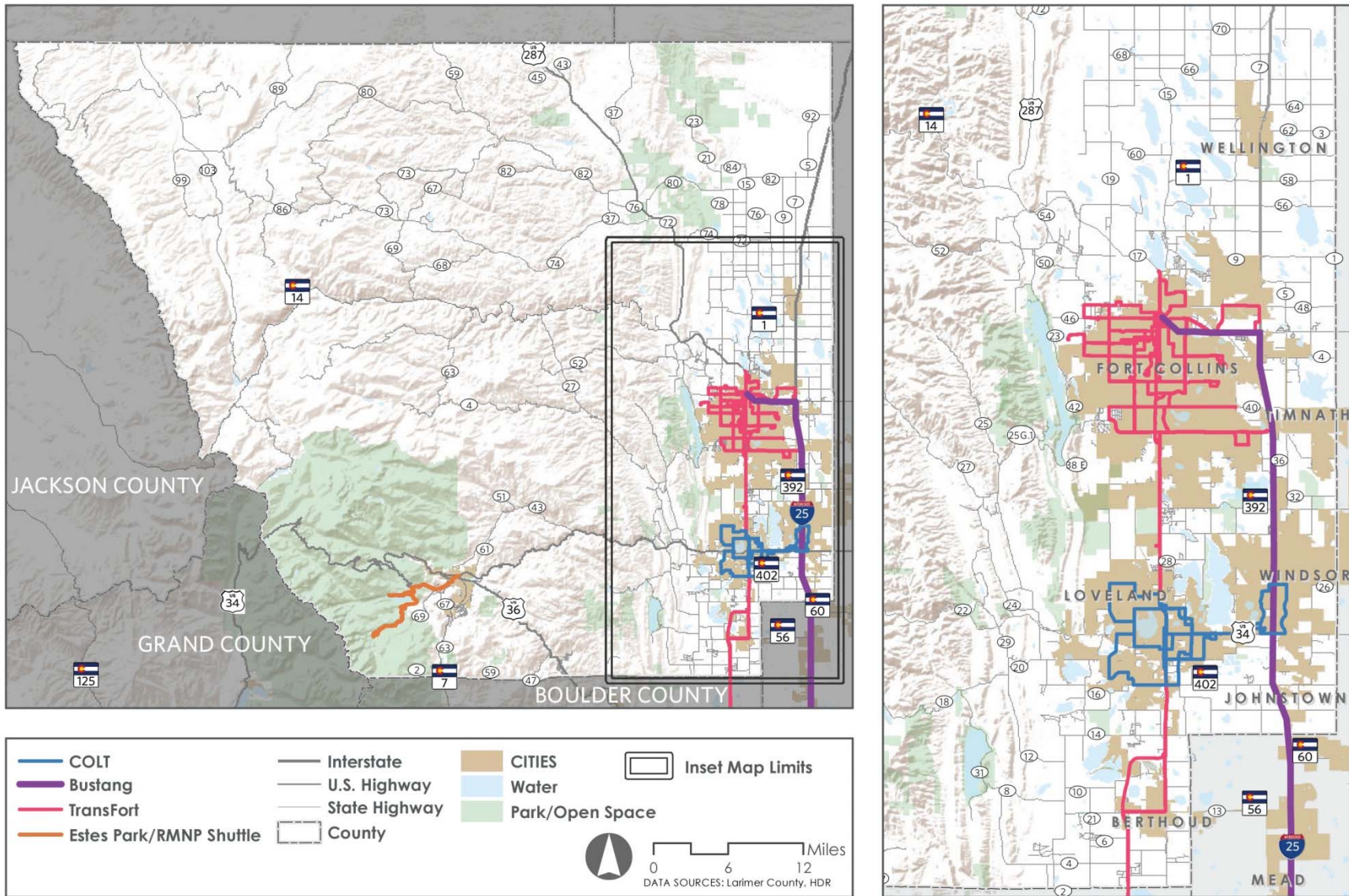
The assessment of senior needs is occurring in three parts. The first was review of peer agencies and best practices. Larimer County evaluated what other counties are doing to provide services for seniors and identified best practices to deliver service no matter the type of local government.

The second step was to conduct outreach to seniors and transportation providers. A survey was distributed to seniors, defined as 60 years of age and older, to determine transportation needs. The survey received a nearly 40 percent response rate with over 560 responses. In addition to the survey, four focus groups were conducted in Red Feather Lakes, Estes Park, Berthoud, and LaPorte. These focus groups dove deeper into transportation issues. The County also sent a short questionnaire to service providers.

In the third step, the results of the two previous steps will be compiled and presented in a report that outlines the transportation needs of senior residents and identifies potential implementation steps.

Whether or not the report will recommend transit services is not yet known. Any implementation steps would need to be coordinated with and funded by the Larimer County Office on Aging to support those efforts.

Figure 16. Existing Fixed-Route Transit Services



MULTIMODAL SUMMARY

Guiding Principle



Diversify the transportation network by considering the development and use of alternative transportation modes during the planning and design process of each transportation project.

Existing & Future Conditions

BICYCLES.

- Some rural county roads are popular bike routes, for both recreation and commuting to school or work.
- Many lack adequate shoulders.



PEDESTRIANS. Few pedestrian facilities exist in the county due to its rural nature, and rural road standards do not require curbs, gutters, or sidewalks. There is a need to develop an ADA Transition Plan to better accommodate persons with disabilities.

TRANSIT. Transit services exist within and between cities and towns, though the County does not currently operate transit. There is a need to develop a senior transportation needs assessment to better serve seniors living in unincorporated Larimer County.

STRATEGIES TO ADDRESS NEEDS

Goals identified through the planning process to address multimodal needs include:

- Provide road rights-of-way and cross sections that are wide enough to accommodate all identified users and functions (autos, transit vehicles, pedestrians, and bicyclists), as practical and feasible.*
- Consider bicycle facilities, such as wide shoulders and bicycle lanes, on roadways that experience high bicycle demand and would provide continuity in the regional bicycle network, where practical.*
- Consider pedestrian crossing improvements where conditions warrant.*
- Coordinate with transit providers to increase the accessibility of transit services in unincorporated Larimer County.*

The County is expanding on multimodal planning through the following initiatives:

- The County is currently developing an ADA Transition Plan, which will identify projects geared toward increasing accessibility and improving the pedestrian environment for all County residents.
- The County is also producing a senior transportation needs assessment, which will identify strategies to adapt the County transportation system to the needs of an aging population.
- The County is implementing a bicycle traffic count program that will aid the prioritization of bicycle mobility improvement projects.



Roadways

Roadways

Guiding Principle 4: Upgrade and expand the Larimer County roadway network to respond to the needs of growth and economic development to provide for the efficient movement of citizens, goods, and services.

Goals and strategies to upgrade and expand existing roadway facilities in Larimer County:

- A. Expand and upgrade existing facilities to maintain a minimum Level of Service D in urban areas and Level of Service C in rural areas.
 - i. Prior to road widening to improve capacity, evaluate the costs and benefits of alternative capacity enhancement strategies.
 - ii. Identify non-paved roads that have exceeded the Average Daily Traffic threshold for paving and prioritize those sections in the Capital Improvement Program funding stream.
 - iii. Follow land use code as it pertains to transportation facilities.
 - iv. Implement access management standards along mainline County roadways to maintain mobility at the desired level of service.
- B. Consider intersection control improvements when signal warrants are met.
 - i. When a signalized intersection is warranted, consider alternative intersection control types such as roundabouts as an alternative to signalizing the intersection.
- C. Consider new roadway connections in areas experiencing growing demand, where expansion of existing facilities is neither sufficient nor feasible.
 - i. Coordinate with other agencies and private developers to equitably share costs and provide resources.
- D. Incorporate the findings and advance the recommendations of the *Larimer Community Resiliency Framework*.
- E. Identify potential and existing freight corridors. Consider safety and capacity improvements on these corridors, as necessary, to be consistent with freight use.

Roadway Attributes

Roadways can be described and analyzed by a variety of attributes, including the following metrics used by Larimer County.

Functional Classification

The roadway network comprises a hierarchy of roadways defined by their functional classification and how they serve the mobility needs of the users. As mobility increases on a roadway, access decreases; and conversely, as access increases, mobility decreases.

The County’s roadway functional classification system has four categories, as described below. The County’s

- 88% of survey respondents use a personal vehicle very often

- 69% of respondents support expanding roadway capacity

-Larimer County
Transportation Assessment,
October-November 2015

functional classification system has not been updated since 2006. See Figure 17 for County roads by roadway classification.

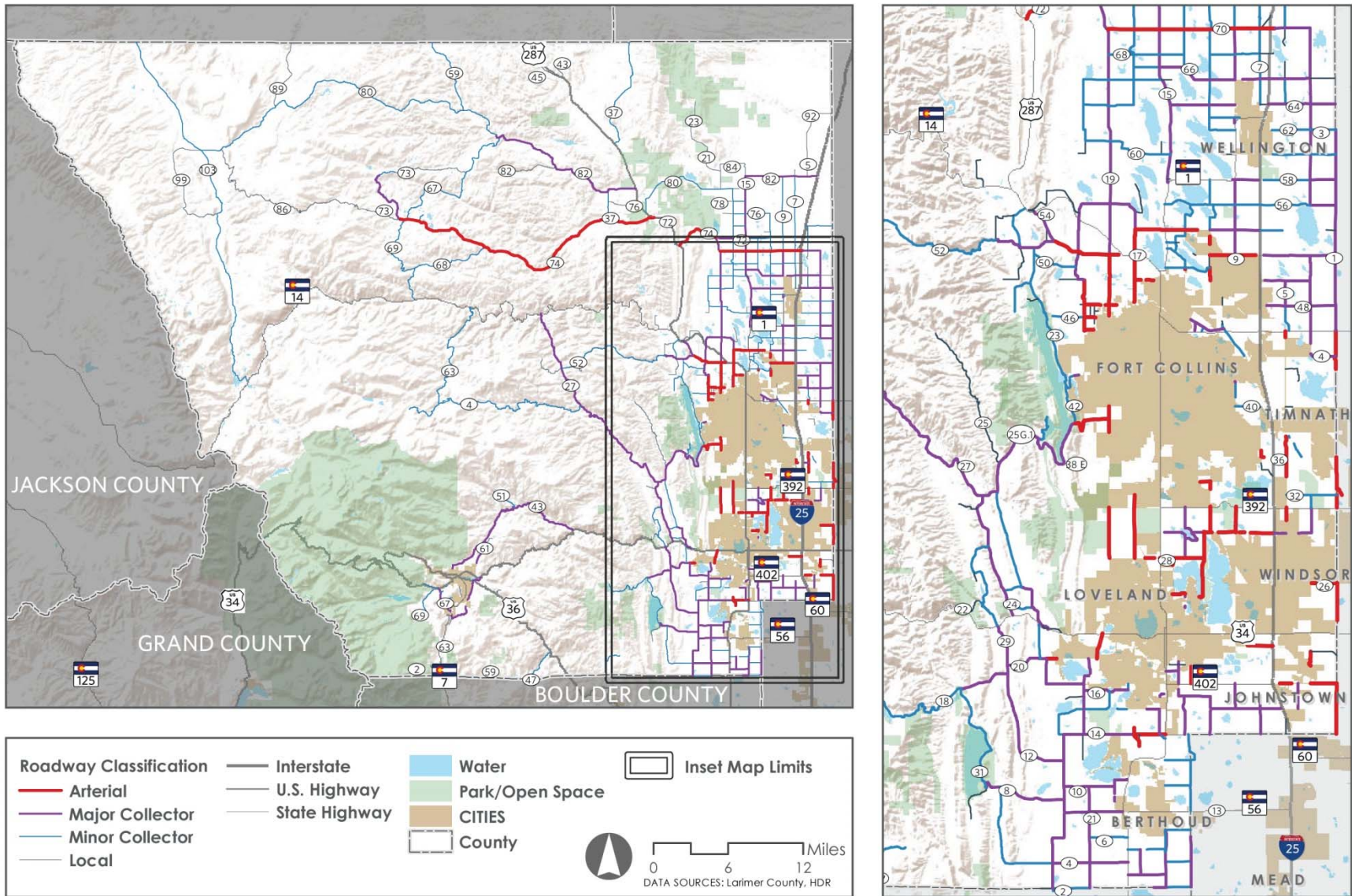
Arterials. Arterials carry longer-distance traffic flow for regional, intercommunity, and major commuting purposes. Arterials have a limited number of at-grade intersections and, only when other alternatives do not exist, direct property access. Arterials can carry significant traffic volumes at higher speeds for longer distances, and are seldom spaced at closer than one-mile intervals. Within Larimer County, any roadway with a possibility of future widening to four lanes is designated as an arterial because of the required right-of-way width.

Major Collectors. In an urban context, major collectors are the next highest classification and are higher-speed roadways where mobility still takes precedence over access. In a rural context, major collectors can take the place of arterials as the highest classification because the lower vehicular volumes in rural areas do not warrant the arterial classification.

Minor Collectors. Minor collectors serve as main connectors between communities and neighborhoods. They distribute traffic between arterials/major collectors and local roads. Most of the traffic on minor collectors has an origin or a destination within the community. Also known as rural secondary facilities, this classification includes most mainline County roads that are not classified as major collectors or arterials.

Local Roads. The primary function of local roads is to provide access to adjacent land uses, including residences, businesses, or community facilities. Local streets generally are internal to or serve an access function for a single neighborhood or development. Traffic using local roads typically has a close-by origin or destination. Typically, mainline County roads with a local classification are limited in length and continuity.

Figure 17. Roadway Functional Classification



Area Type

The County is divided into three area types for the purposes of calculating capacity and developing Capital Expansion Fees—urban, rural, and mountainous. The majority of the roadway miles in the County (48 percent) are classified as mountainous. Approximately 41 percent of the roadway miles are rural, and the remaining 11 percent are urban.

Travel Lanes

A majority of County roads are two lanes with one travel lane in each direction. Multilane roads are three- or four-lane paved roadways. A three-lane road is a road where the third lane serves as a continuous shared left-turn lane or as a climbing lane in the uphill direction, allowing faster vehicles to pass trucks and other slower vehicles. A continuous shared left-turn lane improves traffic flow over a typical two-lane road by allowing turning vehicles to wait in dedicated turn lanes, out of the way of through traffic. The County has only three roadway sections with three lanes, and they are less than 1.5 miles in length combined.

A four-lane roadway has two lanes in each direction and is generally found in more urban areas. Similar to a three-lane roadway, a five-lane roadway has a lane used for a continuous turn lane or a climbing lane, in addition to two travel lanes in each direction. There are currently no four- or five-lane roadway sections within Larimer County’s purview.

Roadway Capacity

Capacity is defined as the maximum number of vehicles that have a reasonable expectation of passing over a given section of road in one direction, or in both directions of a highway, during a given period of time under prevailing traffic conditions and expressed in terms of vehicles per day (vpd).

Standards for capacity of a road vary between rural and urban areas of the County. Urban areas consist of Growth Management Area (GMA) districts and other areas designated by the *Larimer County Master Plan* as urban areas. Rural areas make up all properties outside these urban areas.

Larimer County maintains a roadway inventory for every section of its roadway system. Each section is evaluated for capacity needs in current and future conditions. Road capacities, as defined in this *Transportation Master Plan*, are the maximum traffic volumes that can be accommodated at a desired level of service.

Non-Paved Two-Lane Roads

There are three types of non-paved roadways in the County.

- Native or untreated gravel: No dust control measures.
- Gravel-treated: Gravel surface treated with chemicals to control dust.
- Low type bituminous (chip seal): A treatment that provides an adequate

surface for small volumes of traffic but does not hold up with higher traffic volumes. Many chip-sealed roadways look like a typical paved County road.

Table 13. Capacity for Non-Paved Roads

Surface Type	Capacity (vpd)
Native ¹	200
Gravel treated ²	400
Low type bituminous (chip seal) ²	400

¹Colorado Air Quality Control Commission Regulation 1 Section 3.D

²Larimer County Land Use Regulation

Table 13 shows the daily capacities for each non-paved roadway surface type.

Paved Two-Lane Roads

Table 14 outlines the assumptions used in calculating the two-lane roadway capacities, and Table 15 provides the resulting daily capacities based on lane and shoulder widths.

Table 14. Capacity Assumptions for Paved Two-Lane Roads

	Urban	Rural	Mountain
Level of Service	LOS D	LOS C	LOS C
Terrain	Level	Rolling	Rolling
Directional Split	60%/40%	60%/40%	60%/40%
Heavy Trucks	3%	3%	2%
Recreational Vehicles	1%	1%	5%
No Passing Zones	60%	30%	60%
Peak Hour Factor	0.95	0.95	0.95
Daily Traffic in Peak Hour	9%	8.5%	8.5%
Section Length	1 mile	1 mile	1 mile
Base Free Flow Speed	55 mph	60 mph	55 mph
Access/Mile	10	6	4
Highway Class	Class I	Class I	Class I

Paved roadway capacity varies by roadway area type (urban, rural, and mountainous) and roadway surface width. Anything beyond a 24-foot pavement width is assumed to have shoulders.

Table 15. Daily Capacities of Paved Two-Lane Roads

Lane Width (ft.)	Shoulder Width (ft.)	Pavement Width (ft.)	2015 Daily Two-Way Capacities		
			Urban	Rural	Mountainous
9	0	18	3,700	2,400	1,900
10	0	20	4,600	3,000	2,400
11	0	22	6,600	4,200	3,400
12	0	24	7,700	5,000	4,100
12	1	26	9,200	6,000	5,000
12	2	28	10,700	7,000	5,800
12	3	30	11,900	7,800	6,500
12	4	32	13,100	8,500	7,100
12	5	34	14,200	9,300	7,700
12	6	36	15,300	10,000	8,300

Multilane Roads

Capacities for the three- and four-lane roads were developed from the NFRMPO travel model for the 2006 *Larimer County Transportation Plan*. Multilane roads are assumed in the urban areas only. Table 16 presents the daily capacity for multilane roads in the urban areas.

Traffic

Traffic volumes are an indicator of the use of the roadway. When compared to a road’s capacity, traffic volumes reveal how a road is functioning and if improvements to increase capacity are necessary.

Average Daily Traffic (ADT)

The most commonly used measurement of traffic volume is Average Daily Traffic (ADT). ADT is defined as the total number of vehicles passing a certain point in both directions in a 24-hour period. Larimer County maintains a database of daily traffic volume counts on County roads. The busiest County roads currently carry as many as 20,000 vpd. By 2040, the busiest County roads are projected to see as many as 30,000 vpd. The majority of County roads will see ADT double between now and 2040. The busiest County roads are typically in urban or suburban areas near Fort Collins and Loveland. However, some non-paved County roads will experience an increase in ADT of 5,000 percent or more between now and 2040, such as CR 1 from US 34 to CR 14, which will grow from 200 vpd to 13,000 vpd in 2040.

See Figure 18 and Figure 19 for maps of existing and future ADT, respectively.

Table 16. Daily Capacities for Multilane Roads

Lanes	Urban (LOS D)
3	23,000 ADT
4	32,000 ADT

Figure 18. Existing ADT

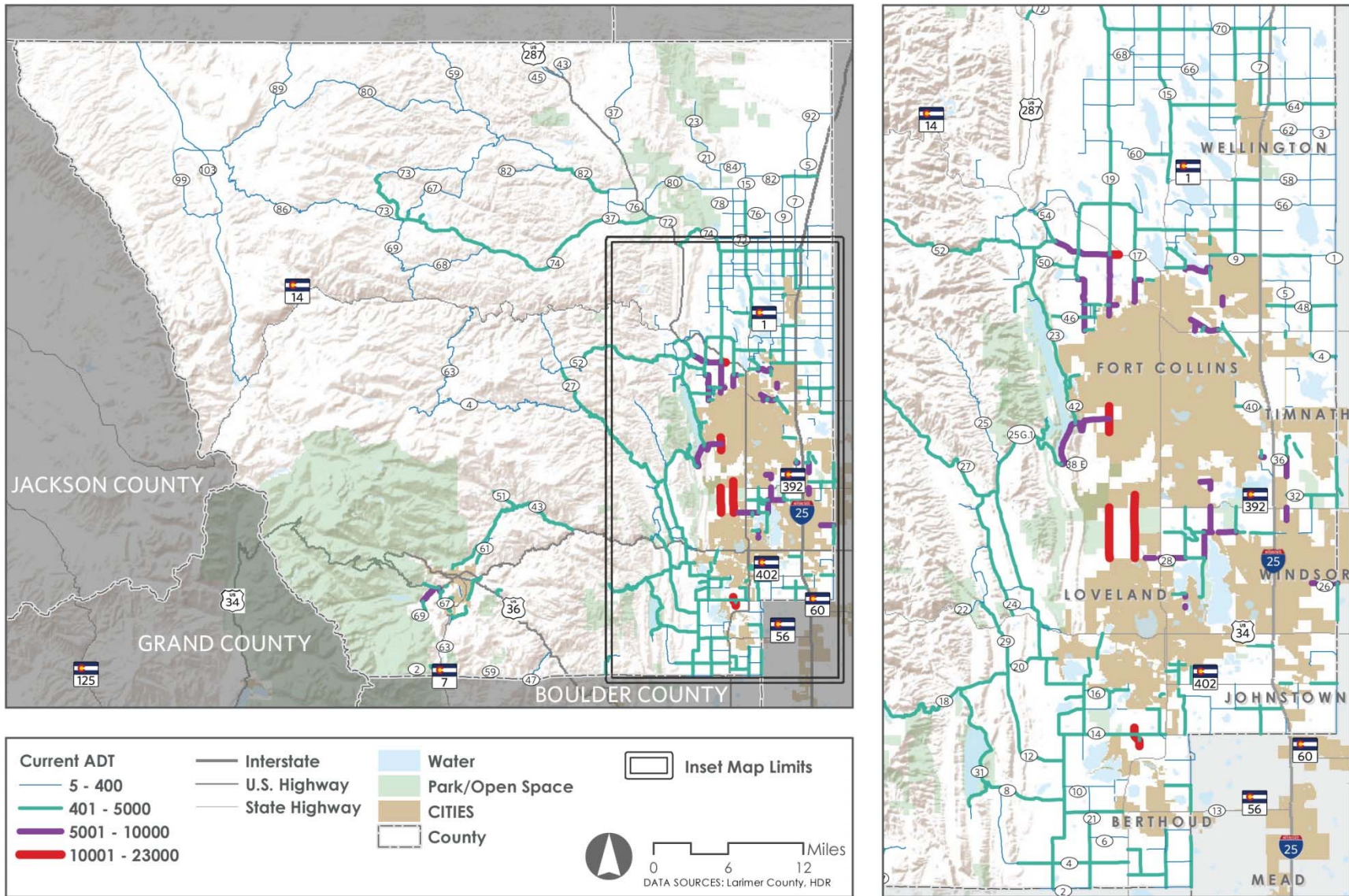
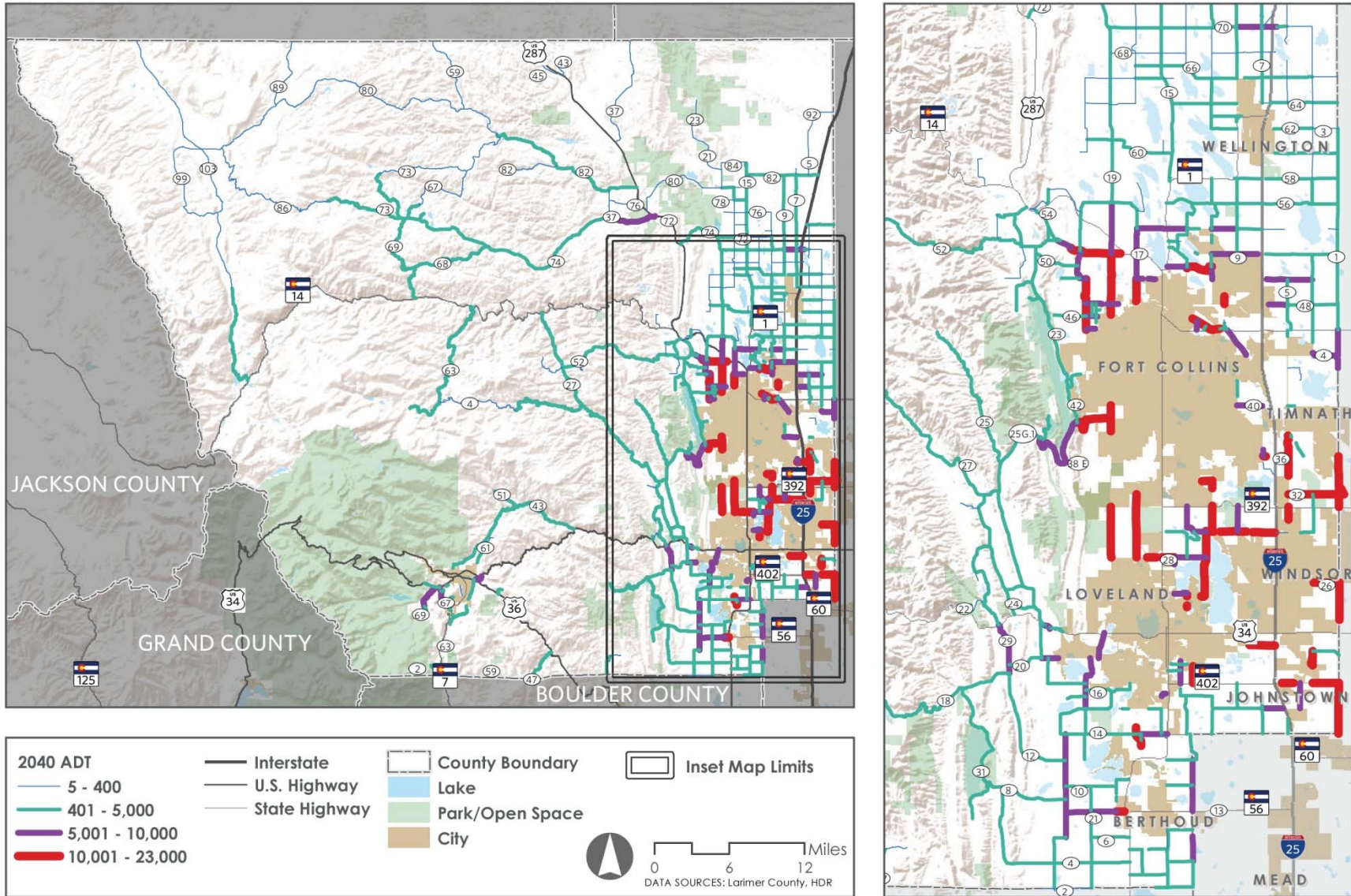


Figure 19. Projected 2040 ADT



Vehicle Miles Traveled

Another measure of traffic is Vehicle Miles Traveled (VMT). This measure is different from ADT in that it describes the amount of travel by capturing the distance that vehicles travel. Table 17 shows the annual VMT and lane-miles on the Larimer County mainline roadway system by area type. As shown, urban roads serve more vehicle miles of travel per lane-mile than both rural and mountain roads, indicating their higher level of traffic, and higher needs for maintenance and capacity improvements.

Table 17. Annual VMT by Area Type

Area Type	Length (in Lane-Miles)	Annual VMT (millions)	Annual VMT per Lane-Mile (thousands)
Mountainous	739	85.6	115.8
Rural	655	120.3	183.7
Urban	159	115.3	725.2
Total	1,553	321.2	206.8

Source: Highways, Larimer County Inventory, 2016

Table 18 summarizes the mileage and VMT on County roads that fall within each functional classification. Arterial roadways have only 10 percent of the lane miles but carry 43 percent of the traffic and are generally around population centers. The collectors account for the majority of the mileage in the County.

Table 18. Annual County Road Miles and VMT by Functional Classification

Functional Classification	Roadway Distance		VMT	
	Distance (Miles)	Percent of Total County Mileage	Annual VMT (millions)	Percent of County VMT
Arterial	80	10%	138.8	43%
Major Collector	241	31%	119.9	37%
Minor Collector	333	43%	56.4	18%
Local Roads	122	16%	6.1	2%
Total	776	100%	321.2	100%

Source: Highways, Larimer County Inventory, 2016

Level of Service

Level of service (LOS) is commonly used to define the quality of traffic flow on various roadway types based on a comparison of traffic volumes with roadway characteristics. A LOS scale ranging from A to F is used to define the quality of flow, with LOS A representing an essentially free-flow situation and LOS F

representing the highest levels of congestion, with traffic volumes exceeding the intended capacity of the roadway.

Note that the LOS scale does not correspond to a school report card A through F. LOS A implies that there is an abundance of roadway infrastructure, requiring more than necessary in capital and maintenance costs. On the other hand, LOS F indicates there is too much congestion. Larimer County has established LOS standards for County roads, which are LOS D or better in urban areas and LOS C or better in rural areas.

The nationally accepted source for highway capacity evaluations, the *Highway Capacity Manual* (2000), along with typical traffic flow characteristics are typically used to approximate the maximum daily traffic volumes for two-lane roadways. However, the *Highway Capacity Manual* (2010) was not used to arrive at Larimer County's LOS criteria of LOS D in urban areas and LOS C in rural areas because calculations were largely geared to urban areas and were not found to be as relevant to rural areas.

The capacity numbers were reviewed and calibrated to more specifically reflect conditions in Larimer County. These capacities range from 15,300 vpd on roads with full-width lanes and shoulders in urban areas to 1,900 vpd on roads with narrow lanes and no shoulders in the mountainous areas.

Roadway Needs

Each of the 600 traffic sections in Larimer County's jurisdiction was analyzed by examining existing maintenance costs and volume-to-capacity ratios to identify current improvement needs. These sections were also analyzed by future volume-to-capacity ratios to identify improvement needs in the long term (before 2040). Volume-to-capacity ratios were calculated for each traffic section using actual traffic counts for existing conditions and projected volumes from a regional travel demand model for the future conditions. Safety needs (see Safety) were identified separately from capacity needs, and it is possible for one traffic section to need both safety and capacity improvements. Possible capacity improvements include:

- Paving a non-paved road
- Widening from two lanes to three lanes
- Widening from two lanes to four lanes
- Constructing a five-lane urban arterial
- Reconstructing a two-lane road with shoulders

Road sections were primarily analyzed by their volume-to-capacity ratios, but non-paved roads were considered for improvements only if they were over capacity and had high maintenance costs. The maintenance costs used in this analysis are an annual average from three years (2012-2015) of actual maintenance costs incurred by Larimer County for each section of non-paved road. Sections that met both of these criteria were identified for paving.

Paved road sections that are currently over capacity were selected for short-term improvements, and paved road sections that will be over capacity by 2040 were selected for long-term improvements. Improvements were identified to minimize project cost and impact to surrounding landowners while increasing capacity above the current and projected traffic volumes. In practice, this means that reconstructing a road with shoulders was considered prior to widening the road to three, four, or five lanes.

Most mountainous roadways cannot be widened to three or more lanes because of the prohibitive cost of altering the roadside topography. Mountainous roadways over capacity were only identified for paving or

reconstruction, regardless of whether or not these improvements satisfied the current and future capacity needs.

The identified improvements were then prioritized based on existing condition volume-to-capacity ratios for the short-term needs. Sections with volume-to-capacity ratios of 1.75 or higher were selected as high priority. Sections with volume-to-capacity ratios between 1.25 and 1.75 were deemed medium priority, and sections with volume-to-capacity ratios below 1.25 were categorized as low priority.

The identified long-term needs were prioritized based on 2040 volume-to-capacity ratios *after the improvement*. Sections with projected volume-to-capacity ratios of 0.5 or higher were selected as high priority. Medium priority improvements will have volume-to-capacity ratios between 0.25 and 0.5, and low priority improvements will have volume-to-capacity ratios below 0.25.

This method produces planning-level analyses that provide the County a short-term and long-term outlook for countywide needs. Other factors not discussed here may indicate improvement needs beyond those identified in this plan. These factors may include, but would not be limited to, adjacent development, access spacing and characteristics, topography, geometry, and partnership opportunities presented through other infrastructure and development projects.

A more detailed description of the needs identification and prioritization processes can be found in Appendix A.

Improvement costs were based on estimated unit costs for each improvement type. These estimates were compiled by the County (in 2016 dollars) and can be found in Appendix E.

Table 19 summarizes short-term improvements and Figure 20 is a map of these needs locations. Appendix A contains a full list of roadway needs.

Table 20 summarizes long-term needs and Figure 21 is a map of these needs locations. For full lists of all identified capacity needs, including section descriptions, see Appendix A.

Table 19. Short-Term Capacity Needs

Type	Number of Traffic Sections	Section Length (miles)	Short-Term Improvement Costs (millions of 2015 \$)
1 - High	13	18.98	\$56.8
Pave	13	18.98	\$56.8
2 - Medium	13	10.14	\$32.7
Pave	11	9.30	\$27.8
Reconstruct	1	0.34	\$1.0
Widen to 5 lanes	1	0.51	\$3.9
3 - Low	7	10.97	\$33.8
Pave	5	10.31	\$30.9
Widen to 3 lanes	2	0.65	\$3.0
Total	33	40.09	\$123.4

Table 20. Long-Term Capacity Needs

Type	Number of Traffic Sections	Section Length (miles)	Long-Term Improvement Costs (millions of 2015 \$)
1 - High	62	61.18	\$225.0
Pave	7	5.96	\$17.8
Reconstruct	22	29.66	\$91.2
Widen to 3 lanes	32	25.23	\$114.3
Widen to 4 lanes	1	0.33	\$1.6
2 - Medium	20	16.07	\$50.6
Pave	17	13.70	\$41.0
Reconstruct	2	1.87	\$5.8
Widen to 5 lanes	1	0.50	\$3.8
3 - Low	65	84.56	\$253.1
Pave	65	84.56	\$253.1
Total	145	160.30	\$525.0

Figure 20. Short-Term Capacity Needs

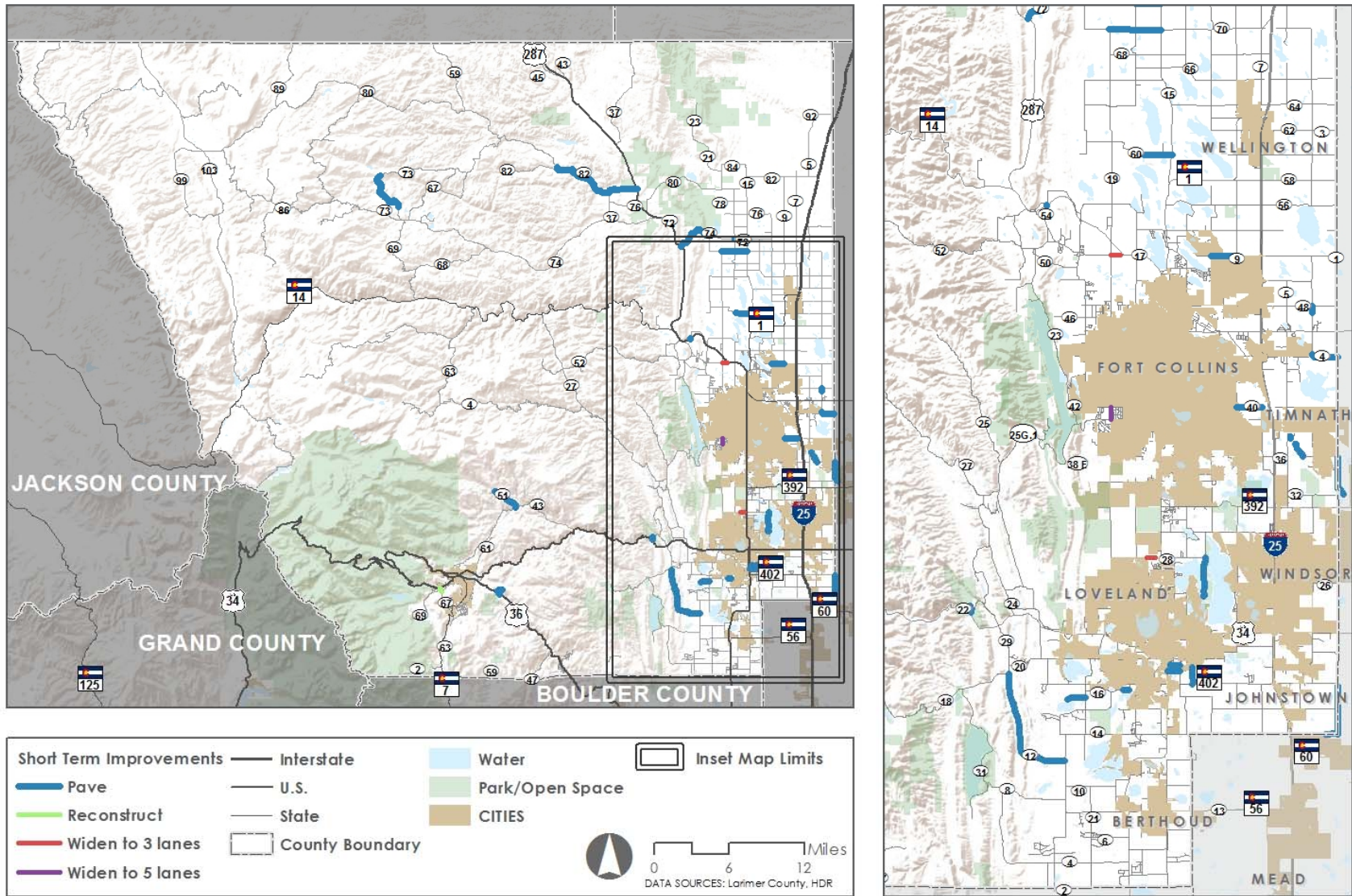
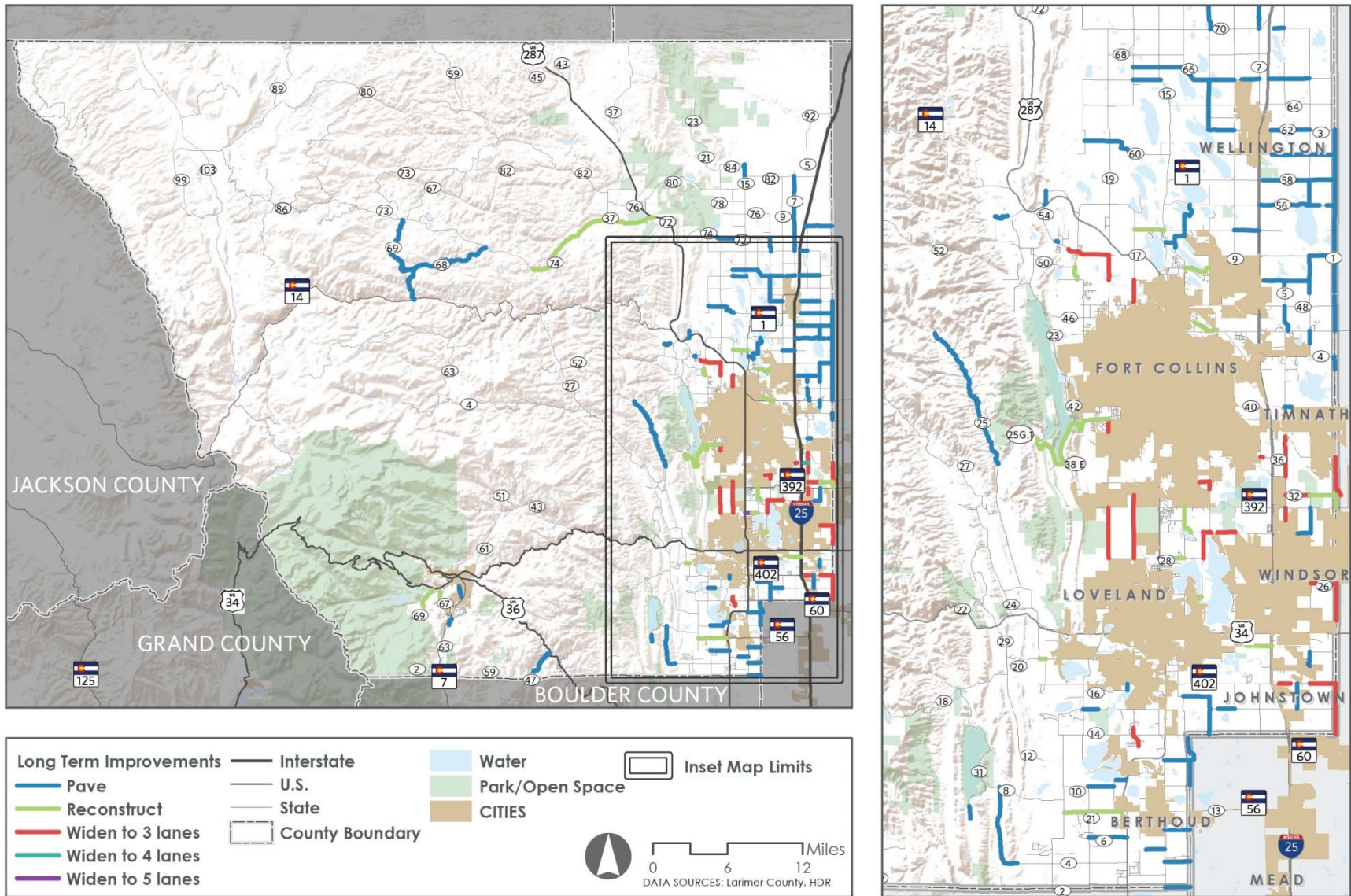


Figure 21. Long-Term Capacity Needs



Existing Intersection Conditions

Larimer County has 66 arterial/arterial or arterial/major collector intersections that are either partially or wholly within the jurisdiction of the County.

Table 21 identifies the type of control measures currently in place at intersections of two County roads. These intersections are wholly within the jurisdiction of Larimer County. Table 22 identifies the type of control measures currently in place at intersections of a County road with a highway. These intersections are shared responsibilities between the County and CDOT.

Table 21. Existing Control Measures at County Road Intersections

N/S Road	E/W Road	Type of Control	Location Description
CR 1	CR 18	Stop sign N/S bound	East of Loveland
CR 1	CR 26	Signal	Windsor
CR 1	CR 44*	Stop sign N/S bound	East of Fort Collins
CR 5	CR 36*	Stop sign E bound	East of I-25, south of Fort Collins
CR 7	CR 36	Stop sign N/S bound	South Fort Collins
CR 9	CR 30	Roundabout	North of Loveland
CR 9*	CR 52	Stop sign E/W bound	North of Fort Collins
CR 9*	CR 70	Stop sign N/S bound	North of Fort Collins
CR 11	CR 30	Roundabout	North of Loveland
CR 11C	CR 28	Stop sign E bound	North of Loveland
CR 11C	CR 30	Roundabout	North of Loveland
CR 13*	CR 28	Signal	North of Loveland
CR 13E	CR 28	Stop sign N/S bound	North of Loveland
CR 15*	CR 70	Stop sign 4 way	North of Fort Collins
CR 17	CR 50	Signal	North of Fort Collins
CR 17	CR 54	Stop sign W bound	North of Fort Collins
CR 19	CR 48	Roundabout	North of Fort Collins
CR 19*	CR 70	Roundabout	North of Fort Collins
CR 19	CR 38E	Signal	South of Fort Collins
CR 19	CR 54G	Signal	North of Fort Collins
CR 21	CR 46	Stop signs E/W bound	West of Fort Collins
CR 21	CR 48	Stop signs E/W bound	Northeast of Fort Collins
CR 21	CR 46E	Signal	East of Fort Collins
CR 21C*	CR 54G	Signal	Town of La Porte
CR 23E*	CR 20	Stop sign N/S bound	South of Loveland
CR 54G	CR 52E*	Stop sign E/W bound	Town of La Porte
CR 73C*	CR 74E	Stop sign E bound	South of Red Feather Lakes

Source: Highways, Larimer County Inventory, 2015

*indicates roadway is a major collector. All other County roads are minor arterials.

Table 22. Existing Control County Road /State Highway Intersections

N/S Road	E/W Road	Type of Control	Location Description
CR 1	SH 14	Stop sign N/S bound	East of Fort Collins
CR 1	SH 392	Signal	Windsor
CR 1	US 34	Stop sign N/S bound	Johnstown/Windsor
CR 3*	SH 14	Stop sign N/S bound	East of Fort Collins
CR 3*	SH 392	Stop sign N/S bound	West of Windsor
CR 5	SH 14	Stop sign N/S bound	East of Fort Collins
CR 5	SH 392	Signal	Windsor
CR 7*	SH 60	Stop sign S bound	South of Loveland
CR 9*	SH 1	Stop sign S bound	Wellington
CR 9	SH 392	Stop sign N bound	South of Fort Collins
CR 9*	SH 402	Stop sign N bound	South of Loveland
CR 11	SH 392	Signal	South of Fort Collins
CR 11*	SH 60	Stop sign S bound	South of Loveland
CR 11F*	SH 14	Signal	East of Fort Collins
CR 11H	SH 402	Signal	Southeast of Loveland
CR 13*	SH 392	Signal	South of Fort Collins
CR 13*	SH 60	Stop sign S bound	South of Loveland
CR 15*	SH 1	Stop sign S bound	South of Wellington
CR 17	US 287	Signal	North of Fort Collins
CR 21C*	US 287	Stop sign N/S bound	North of La Porte (town)
CR 23H*	US 34	Stop sign N bound	West of Loveland
CR 27*	SH 14	Stop sign N bound	Poudre Canyon & Stove Prairie
CR 27*	US 34	Stop sign S bound	West of Loveland
CR 29*	US 34	Stop signs N/S bound	West of Loveland
CR 43*	US 34	Stop sign on E bound	Between Loveland & Estes Park
CR 54G*	US 287	Stop signs N/S bound	West of La Porte (town)
CR 63*	US 34	Stop sign N bound	East of Estes Park
CR 63*	US 36	Stop sign N bound	East of Estes Park
CR 63*	US 36	Stop sign S bound	East of Estes Park
SH 1	CR 54	Stop signs E/W bound	North of Fort Collins
SH 1	CR 58*	Stop sign on W bound	South of Wellington
I-25	CR 82*	Stop signs on exit ramps	Rawhide Power Plant
I-25 EFR	CR 36*	Stop sign S bound	South of Fort Collins
I-25 WFR	CR 36*	Stop sign N bound	South of Fort Collins
I-25 WFR	CR 58*	Stop sign on N/S bound	South of Wellington
US 287	CR 72	Stop sign W bound	North-central County
US 287	CR 2E*	Stop sign W bound	South of Berthoud
US 287	CR 74E	Stop sign E bound	Livermore
US 287	CR 80C*	Stop sign E bound	North-central County

Source: Highways, Larimer County Inventory, 2015

*indicates roadway is a major collector. All other County roads are minor arterials.

Intersection Needs

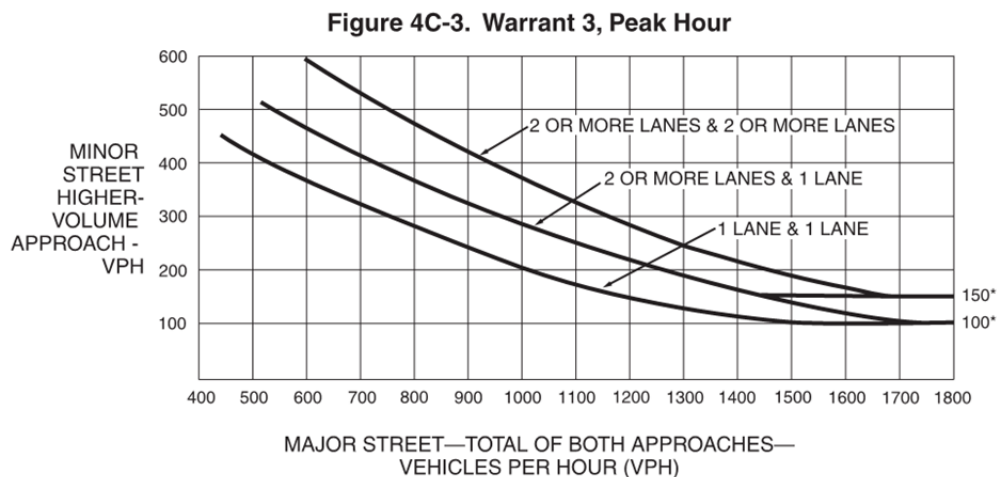
CDOT conducted the *Region 4 Intersection Priority Study* in 2016 to prioritize improvements for intersections with the state highway system. This review and subsequent prioritization was based on safety, operational, and geometric needs, including capacity issues. See the Roadway Safety section of this document for a summary and Table 6 for a description of improvements recommended for the three County road intersections included in the top 25 priority intersections (US 34 (Eisenhower Boulevard) & Boyd Lake Avenue (CR 9), US 287 (Lincoln Avenue) & 14th Street (SH 402, CR 18), and SH 1 & Douglas Road (CR 54)).

Additionally, because the CDOT *Region 4 Intersection Priority Study* was limited to County road intersections on the state highway system, signal warrant analyses were conducted on arterial-arterial intersections and arterial-major collector intersections wholly within the County’s jurisdiction as part of this *Transportation Master Plan*. These intersections are listed in Table 21. It is assumed that intersections of streets with lower functional classifications do not have the volumes to warrant an intersection control upgrade. The results are provided in Table 22.

Intersections with roundabouts or signals were not included in this analysis. Only stop-controlled intersections or intersections without control measures were evaluated.

The standards for signal warrant analyses can be found in Chapter 4C of the *Manual on Uniform Traffic Control Devices* (MUTCD). Because of the limited information available at the time of this *Transportation Master Plan*, only the Peak Hour Traffic Volume warrant was used. Section 4C.04 – Warrant 3, Peak Hour of the MUTCD states that “the need for a traffic control signal shall be considered if the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume minor-street approach (one direction only) for one hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 (included as Figure 22 in this *Transportation Master Plan*) for the existing combination of approach lanes.”

Figure 22. Signal Warrant Traffic Volumes



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: Manual on Uniform Traffic Control Devices

To analyze each intersection in terms of peak hour, a “k” factor of 0.1 was applied to the ADT volumes for each intersection. The County road with the highest ADT of the two intersecting roads was identified as the major street within the intersection. Once the ADT volumes for both the major and minor streets were converted to peak hour volumes, each intersection was plotted on Figure 22.

This methodology showed that none of the 16 intersections evaluated warrants an intersection control device upgrade based on current traffic volumes. See Table 23.

The same procedure was applied to determine future intersection needs using projected 2040 ADT volumes. Seven of the 16 analyzed intersections will warrant upgraded intersection controls by 2040, all of which are close to the urban areas. See Table 23 for future intersection needs, and Figure 23 for a map of these identified intersections.

The full analysis for intersection control devices can be found in Appendix D.

Note that although this analysis is intended to determine a need for a signal, the actual type of control device can vary. For example, a roundabout or a mini roundabout could be installed instead of a traffic signal to address identified needs. Signaling a single intersection costs approximately \$375,000, meaning the seven intersections that warrant signals in 2040 could be improved for a total cost of approximately \$2.6 million. On the other hand, full-size roundabouts have a significantly higher up-front cost in the range of \$1 million to \$1.5 million per intersection.

Despite the higher capital costs, studies have shown that full-size roundabouts provide a greater benefit-cost ratio than do signalized intersections. In general, roundabouts reduce the total number of crashes, the severity of crashes, vehicular delays, and greenhouse gas emissions. Compared to signalized intersections, roundabouts:

- Reduce all crashes by 35 percent and injury crashes by 76 percent¹²
- Reduce traffic delays by 13 to 23 percent¹³
- Reduce emissions by up to 42 percent and fuel consumption by 30 percent¹⁴
- Reduce operational costs by an average of \$5,000 per year over the roundabout’s lifespan of approximately 25 years¹⁵

Other benefits of roundabouts include the reduction of noise pollution, improved aesthetics, and longer lifespans.

Mini roundabouts provide many of the same benefits at a much lower cost. They use the same operating principles as full-size roundabouts, but have a smaller land impact. Mini roundabouts have a smaller diameter of 50 to 90 feet and unlike full-size roundabouts, mini roundabouts have fully traversable central islands and splitter islands. Although mini roundabouts have a wide cost range of \$25,000 to \$400,000 per intersection, high-capacity mini roundabouts tend to cost approximately the same as a signal.

Mini roundabouts would be appropriate for most of the intersections in Table 23 based upon their projected 2040 ADTs, with the exception of the CR 1/CR 18 and CR 1/CR 26 intersections, which have ADTs too high to consider mini roundabouts. Mini roundabouts require less right-of-way than full-size roundabouts and are still designed to allow trucks, buses, and other large vehicles to drive over the center island and splitter islands, granting full use of the intersection.

¹² <https://safety.fhwa.dot.gov/intersection/innovative/roundabouts/fhwasa10006/#s2>

¹³ <https://www.nevadadot.com/safety/roundabout/benefits.aspx>

¹⁴ <https://www.nevadadot.com/safety/roundabout/benefits.aspx>

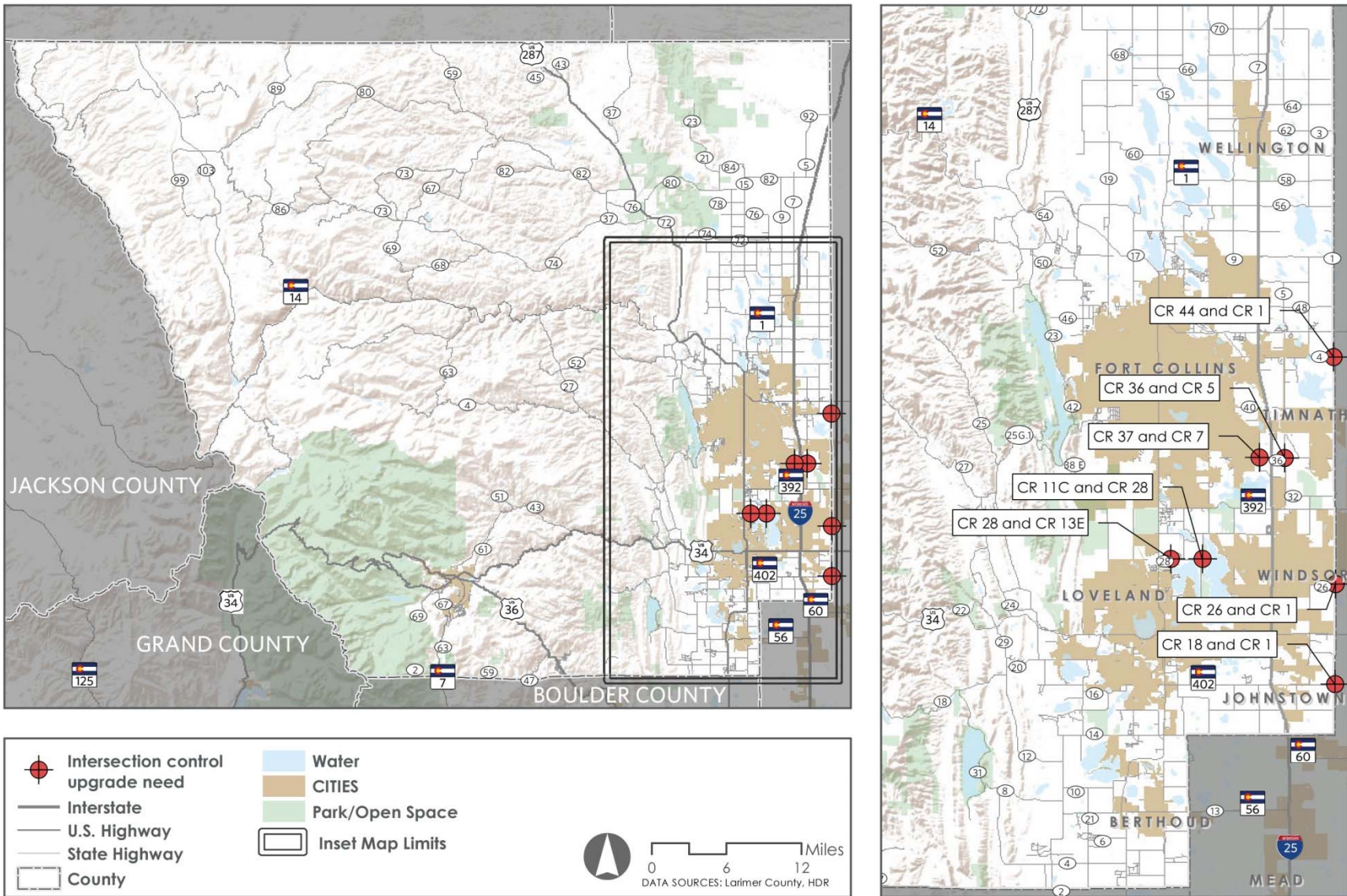
¹⁵ <https://www.nevadadot.com/safety/roundabout/benefits.aspx>

Given these benefits, the County should consider alternatives to signalization when intersections warrant control devices and determine the appropriate context-sensitive solution.

Table 23. Intersection Control Upgrade Needs

Intersection		Intersection Control Upgrade Needed?	
Major Street	Minor Street	Existing Conditions	Future Conditions
CR 18	CR 1	No	Yes
CR 26	CR 1	No	Yes
CR 44	CR 1	No	Yes
CR 5	CR 36	No	Yes
CR 36	CR 7	No	Yes
CR 9	CR 52	No	No
CR 70	CR 9	No	No
CR 11C	CR 28	No	Yes
CR 28	CR 13	No	No
CR 28	CR 13E	No	Yes
CR 70	CR 15	No	No
CR 54	CR 17	No	No
CR 21	CR 48	No	No
CR 20	CR 23E	No	No
CR 54G	CR 52E	No	No
CR 74E	CR 73C	No	No

Figure 23. Intersection Control Upgrade Needs



Freight

Freight movement is critical to the health of Larimer County's economy. Efficient and reliable truck deliveries allow businesses, residents, and visitors to get products at the right time. It is important that the Larimer County roadway system supports efficient freight mobility.

The *Colorado Statewide Highway Freight Plan* (<http://coloradotransportationmatters.com/other-cdot-plans/freight/>) identifies freight corridors in Colorado. Within Larimer County, priority freight corridors are:

- I-25
- US 287
- SH 14, from US 287 east to the County line, and
- US 34, from US 287 east to the County line.

In addition, sections of CR 5 and CR 19 are heavily used truck routes in Larimer County.

Currently, Owl Canyon Road (CR 70) is undergoing a major improvement project that will ultimately connect I-25 and US 287 after full build-out. This roadway segment is currently classified as an arterial roadway, linking two State arterial corridors. It is expected that this connection will continue to attract commercial motor vehicle traffic.

As an interstate highway, I-25 is the principal freight corridor in Larimer County. I-25 is part of the multistate Camino Real corridor from El Paso, Texas, to the Canadian border, which is identified by the US Congress as one of the High Priority Corridors on the National Highway System. In the past, High Priority Corridors received beneficial status for funding of improvements because of their critical role in freight movement across the country. A Port of Entry is located south of the I-25 and Prospect Road interchange in Larimer County. North of Larimer County in Wyoming, I-25 connects with I-80, a major east-west interstate freight corridor. Commercial motor vehicles also connect to I-80 via US 287 and SH 14 through Larimer County, which is a shorter path for vehicles using I-80 to and from the west.

Larimer County's transportation system handles an increasing volume of truck freight every year. The growth of transport of heavy cargo places an increasing demand on the County's infrastructure.

Hazardous Materials

Hazardous and nuclear materials can only be transported on designated roadways determined by the State of Colorado. Within Larimer County, the transport of all hazardous materials is limited to I-25. SH 14 and US 34 are also designated routes for hazardous materials from I-25 to the east. Transport of nuclear materials is restricted to I-25.

Truck Restrictions

There is a vehicle height restriction of 14 feet 5 inches on SH 14 approximately 15 miles west of US 287 because of a tunnel. There are weight limits restricting trucks from some US 287 bridges within Larimer County, depending on axle spacing and load weight. In addition to the following load-posted structures, Larimer County is preparing a bridge weight limit map with restricted structures based on extra-legal vehicle or load permit type. The regulations within the Colorado Revised Statutes Title 42 Article 4 Part 5 provide the backdrop for size and weight restrictions on off-system networks (i.e., local roads). Larimer County is also updating the 1978 Resolution for the Movement or Operation of Extra-Legal Vehicles and Loads on Larimer County roadways. Both programs are expected to be complete by the end of 2017.

Table 24 shows truck restrictions on bridges by truck type. Type I is a single unit truck, Type II is a tractor semi-trailer, and Type III is a truck trailer. More information on these truck classifications can be found here: <http://www.co.larimer.co.us/ENGINEERING/Bridges/brlimit2.htm>.

Table 24. Bridge Load Restrictions

Bridge Structure No.	Crossing	Load (tons)	Type I	Type II	Type III
3-0.2-50	Larimer County Canal		21	33	34
17-0.0-70	North Poudre Canal	25			
18-0.4-23E	Handy Ditch	10			
25E-1.3-52E	Pleasant Valley & Lake Canal	25			
43H-0.1-45B	Little Thompson River		22	34	35
45E-0.2-S287	Dale Creek		12	20	20
45E-0.4-S287	No Name Creek		23	35	36
45E-1.0-S287	Dale Creek Tributary		10	16	16
45E-1.3-S287	Dale Creek Tributary		25	39	41
54E-0.7-27E	Pleasant Valley & Lake Canal	25			
56-1.1-I25	Larimer County Canal	25			
63E-4.7-44H	Little Beaver Creek		26	41	41
80C-2.6-59	North Fork Cache La Poudre River	25			
103-6.8-S14	Laramie-Poudre Canal		24	37	38
9-1544BTC	Big Thompson River	Closed			
16-0.10-21	South Side Ditch		22	34	34

Oil & Gas

The western portion of the Denver-Julesburg Basin, which produces over 80 percent of Colorado’s crude oil, is located in eastern Larimer County. There are currently 261 active oil and gas wells in the County, with 28 drilling permits for new wells issued in 2015. On average it takes more than 2,200 vehicle trips to develop a single oil and gas well and 730 truck trips per well per year for maintenance during the production phase.¹⁶

While exploration and production is occurring at a far greater pace in adjacent Weld County, the truck traffic related to development within Larimer County puts a strain on rural roads, particularly those not designed for the heavy loads.

The County needs to identify heavily-trafficked freight corridors, including connections to and from I-25 and roadways surrounding the Denver-Julesburg Basin, for geometric and safety improvements to better accommodate freight traffic for continued economic development of the region.

¹⁶ <http://www.boulderCounty.org/doc/landuse/dc120003oilgasroadwaystudy20130114.pdf>

ROADWAY CAPACITY SUMMARY

Guiding Principle



Upgrade and expand the Larimer County roadway network to respond to the needs of growth and economic development to provide for the efficient movement of citizens, goods, and services.

Existing & Future Conditions

- **60+ miles of county roads currently over capacity.**
- **With no improvements, this could grow to 250+ miles by 2040.**
- **39 miles of paving projects are needed in the short term.**
- **104 miles of paving projects and 56 miles of widening or adding shoulders are needed in the long term.**

ROADWAYS. Roadways in the County can be described by a variety of attributes: functional classification, area type, travel lanes, capacity, and traffic. Using these characteristics, the County identified **\$123 million in short-term capacity needs and \$525 million in long-term capacity needs.** Paving accounts for 94 percent of short-term needs by cost.

INTERSECTIONS. Existing traffic levels show that no intersections in the County currently warrant new control devices (signal or roundabout). Forecasted volumes indicate that seven intersections may need control upgrades in the future.

FREIGHT. I-25, US 287, SH 14, and US 34 are priority freight corridors within Larimer County, but none fall under the jurisdiction of the County. 16 bridges within the County restrict freight traffic.

How does the County plan to address roadway capacity issues?

Goals identified through the planning process to address roadway needs include:

- A. *Expand and upgrade existing facilities to maintain a minimum Level of Service D in urban areas and Level of Service C in rural areas.*
- B. *Consider intersection control improvements when signal warrants are met.*
- C. *Consider new roadway connections in areas experiencing growing demand, where expansion of existing facilities is neither sufficient nor feasible.*
- D. *Incorporate the findings and advance the recommendations of the Larimer Community Resiliency Framework.*

The County will identify potential and existing freight corridors. Consider safety and capacity improvements on these corridors, as necessary, to be consistent with freight use.

The County aims to address medium and high priority capacity needs in the short term. The County is planning to address high priority capacity needs and all intersection needs in the long term, but conditions will continue to be monitored.

A review of safety data has shown that roundabouts result in fewer crashes and crashes with lower severity than signalized intersections. As traffic volumes increase and intersections require control upgrades, the County will assess each intersection for roundabout suitability.



Implementation

Implementation

Guiding Principle 5: Establish and implement a Capital Improvement Program for County transportation facilities.

Goals and strategies to ensure that the recommended improvements within this plan are funded in an economically sound fashion:

- A. Identify a methodology for prioritizing projects which emphasizes the importance of maintaining the existing roadway system.
- B. Consider consistency with the *Larimer County Master Plan* as an element of project prioritization for roadway maintenance and improvement.
- C. Identify methods to share costs with adjacent cities and other governmental entities.
- D. Consider identifying dedicated funding for alternative transportation modes.
- E. Update the Transportation Capital Improvement Program on an annual basis.

Summary of Projects, Costs, and Priorities

According to the guiding principles established for this *Transportation Master Plan*, improvement needs were identified in the categories of maintenance, roadway capacity, safety, intersection capacity, and bridges. The needs shown in Table 25 are determined to be either short term (based on existing conditions) or long term (based on projected conditions in 2040).

Though roadway sections have been identified and prioritized for safety improvements, the specific safety improvement is unknown and could range from an installation of a pedestrian light to complete reconstruction. The County will need to inspect each of these identified roadway sections to determine crash trends and, from there, recommend an appropriate solution.

Table 25. Summary of Needs through 2040

Needs Category	Funding Budget	Short-Term (Existing Conditions) (2017 \$ in millions)	Long-Term (Future Conditions) (2017 \$ in millions)
Pavement Maintenance	Road and Bridge	\$8.1*	\$186.7
Capacity	Capital Improvements	\$123.4	\$528.6
Safety	Capital Improvements	Further analysis needed	Further analysis needed
Intersections	Capital Improvements	\$0	\$2.1 - \$10.5
Bridge	Structures	\$15.6**	\$82.6

*Short-term maintenance need is shown on an annual basis

**Capital Improvement Program, 2017-2021

More information on each of these needs categories can be found in previous chapters.

Short-term needs total \$147.1 million, and long-term needs range from \$800.0 million to \$808.4 million. These needs will grow as specific safety improvements are identified. The variation in long-term

intersection needs stems from the choice of installing a signal or a roundabout at intersections that warrant control devices. Though the cost difference between a signal and a roundabout can be large, intersection needs account for a small percentage of the total funding needs.

Funding Shortfall

Funding Sources

Larimer County receives funds from a variety of taxes, fees, and other sources to fund its transportation system maintenance and improvements. These funding sources are described below and categorized by the entity that provides them: Larimer County, the State of Colorado, the United States federal government, and grant-giving organizations and agencies. See Table 26 for a Larimer County summary of the current annual transportation funding and transportation funding accumulations by 2040.

Larimer County

- **Real Property Taxes/ Mill Levy.** A mill levy is the assessed property tax rate used by local governments and other jurisdictions to raise revenue to cover annual expenses. A portion of the mill levy is dedicated to the Larimer County Road and Bridge Department.
- **Specific Ownership Taxes.** A portion of the vehicle registration tax that is paid annually by vehicle owners. The County's entire share goes to the Larimer County Road and Bridge Department.
- **Cable Franchise Fees.** This fee is charged for the use of right-of-way to operate licensed cable television franchises in Larimer County. Contracts are negotiated approximately every five years, and the fee is based upon a percentage of revenue.
- **Traffic Fines.** County share of traffic fines issued by the Office of the Sheriff.
- **Transportation Capital Expansion Fees.** Fees assessed on development or redevelopment of property within the County.

State of Colorado

- **Highway User Trust Fund (HUTF).** State gas tax of 22 cents per gallon and other revenues such as registration fees, vehicle rental fees, and other surcharges that are split between the State, cities, and counties. Counties receive 22 percent of the proceeds, which is then allocated based on number of registered vehicles (80 percent of the formula) and number of center lane miles in the jurisdiction (20 percent of the formula).
- **Severance Tax.** The distribution represents 15 percent of the revenues collected in the Local Government Severance Tax Fund to counties or municipalities on the basis of residence of severance taxpayer production employees as reported to the Department of Revenue by severance taxpayers.
- **Motor Vehicle Tax.** Local share of State Motor Vehicle taxes.

US DOT

- **Forest Reserve Act.** Share of revenues generated from National Forest Lands and distributed on a formula to local government.
- **Mineral Lease.** Mineral royalties, rents, and bonuses from federal lands in Larimer County.
- **Payments in Lieu of Taxes (PILT).** PILTs are federal payments to local governments that help offset losses in property taxes due to nontaxable federal lands within their boundaries.

Grants

Larimer County is a member of the NFRMPO and the UFRTPR, which both issue calls for projects through a competitive application process. Both organizations allocate Congestion Mitigation and Air Quality (CMAQ) funds, while the NFRMPO also allocates Transportation Alternatives (TA) and Surface Transportation Block Grant Program (STBGP) funds. These funds are made available through the current federal transportation legislation called the Fixing America's Surface Transportation (FAST) Act.

On December 4, 2015, the Fix America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) was signed into law. This became the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes \$305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs.

CDOT also allocates funding for TA, Highway Safety Improvement Program (HSIP) and Bridge Off-System.

Each of the potential grant funding sources is described below. Grants are competitive applications and there is no guarantee of funding.

- **TA.** TA is authorized under the FAST Act. This grant provides funding for programs and projects defined as transportation alternatives. These programs include, but are not limited to, on-road and off-road bicycle and pedestrian facilities, infrastructure for non-driver access to public transportation, recreational trail program projects, and Safe Routes to School projects.
- **STBGP.** The FAST Act converts the long-standing Surface Transportation Program into the STBGP acknowledging that this program has the most flexible eligibilities among all federal-aid highway programs and aligning the program's name with how the FHWA has historically administered it. The STBGP promotes flexibility in state and local transportation decisions and provides flexible funding to best address state and local transportation needs.
- **CMAQ.** The FAST Act continued the CMAQ program to provide a flexible funding source to state and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the NAAQS for ozone, carbon monoxide, or particulate matter (nonattainment areas), and for former nonattainment areas that are now in compliance (maintenance areas). Types of improvement projects include intelligent transportation systems, alternative fuel vehicles and vehicle retrofitting, non-motorized improvements, and alternative fuel bus purchases and replacements.
- **Bridge Off-System.** Any bridge or road not on the National Highway System is considered to be off-system from the standpoint of federal aid. There is a strong possibility that this grant will be eliminated as funding has been rapidly declining. These funds were not used to forecast future funding for Larimer County.
- **HSIP.** The purpose of these funds is to achieve a significant reduction in traffic fatalities and serious injuries on all public roads, including non-State-owned roads and roads on tribal land. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads with a focus on performance.

Table 26. Current Transportation Funding

Transportation Fund	Source	Annual Funding (2017 \$)	Projected Funding Accrual by 2040 (2017 \$)
Real Property/Mill Levy	County	\$1,760,000	\$40,480,000
Specific Ownership Taxes	County	\$8,100,000	\$186,300,000
Cable Franchise Fees	County	\$260,000	\$5,980,000
Traffic Fines	County	\$600,000	\$13,800,000
Capital Expansion Fee	County	\$1,145,000	\$26,335,000
County Subtotal		\$11,865,000	\$272,895,000
HUTF	State	\$8,330,000	\$191,590,000
Severance Tax	State	\$90,000	\$2,070,000
Motor Vehicle Tax	State	\$400,000	\$9,200,000
State Subtotal		\$8,820,000	\$202,860,000
Forest Reserve Act	Federal	\$60,000	\$1,380,000
Mineral Lease	Federal	\$100,000	\$2,300,000
Payment in Lieu of Taxes	Federal	\$1,670,000	\$38,410,000
Federal Subtotal		\$1,830,000	\$42,090,000
Misc. Grants	Grants	\$500,000	\$11,500,000
Total Funds		\$23,015,000	\$529,345,000

Larimer County distributes transportation funding into two categories: Road and Bridge Operational Funding and Transportation Capital Improvement Funding. The \$23 million in average annual funding from Table 25 is distributed at approximately \$13.5 million for operations (including pavement maintenance) and \$10 million for capital improvements. Funding for structures has traditionally depended on Bridge Off System grants, but that funding source is no longer viable.

Table 26 shows that \$23 million in transportation funding is available today and another \$529 million (2017 dollars) in transportation funding will be available by 2040. Maintenance, pavement preservation, and the capital improvement projects presented within this *Transportation Master Plan* are projected to cost nearly \$1 billion in 2017 dollars between now and 2040, leaving a transportation funding shortage of close to \$450 million, or \$20 million per year during that timeframe.

In a scenario where capacity improvements are limited to the medium and high priority projects in the short term and only the high priority projects in the long term, the funding shortfall is still projected to be more than \$12 million per year through 2040.

Implementation Plan

Capital Improvement Program (CIP)

The 2017 5-Year Capital Improvement Program is available online at <http://www.co.larimer.co.us/engineering/transportation.htm> and is summarized below. The CIP has identified more than \$167 million in total projects for the next five years, and is the foundation for an

implementation plan. The CIP projects include flood recovery projects, which account for 34 percent of the total budget. Flood recovery projects are being funded through non-traditional sources. A summary of CIP projects is presented in Table 27.

Table 27. CIP Projects

Project Type	Project Costs	Percent of Total CIP Funding
Roadway Construction and Expansion	\$45,472,000	27%
Bridges and Drainage Facilities	\$15,576,000	9%
Pavement Preservation and Maintenance	\$38,536,000	23%
Intersections, Safety, and Multimodal	\$10,465,000	6%
Subtotal	\$110,049,000	66%
Flood Recovery	\$57,405,000	34%
Total Funds	\$167,454,000	100%

Transportation Funding Study

The *Larimer County Strategic Plan (2013-2018)* identified the following goal:

By the end of 2016, a prioritized list of transportation needs in unincorporated Larimer County will be completed, and the gap between existing funding and the cost of those prioritized needs will be identified. By the middle of 2017, options to close the gap in transportation funding will be identified.

This *Transportation Master Plan* addresses the first part of the goal, and the County is currently conducting a Transportation Funding Study to address the second part of the goal and identify ways to address the funding shortfall. This study will consist of the following components:

- Evaluation of existing funding sources
- Projection of available funding given current conditions
- Review of peer county revenue streams and transportation expenditures
- Identification and summary of additional potential funding opportunities
- Decision-making matrix to establish plan for funding projects by type

IMPLEMENTATION SUMMARY

Guiding Principle



Establish and implement a Capital Improvement Program for County transportation facilities.

Existing & Future Conditions

A summary of the needs identified in this *Transportation Master Plan*, as well as other planning efforts, is below. Short-term needs total more than \$145 million, and long-term needs total approximately \$800 million.

Needs Category	Funding Budget	Short-Term (Existing Conditions) (2017 \$ in millions)	Long-Term (Future Conditions) (2017 \$ in millions)
Pavement Maintenance	Road and Bridge	\$8.1	\$186.7
Capacity	Capital Improvements	\$123.4	\$528.6
Safety	Capital Improvements	Further analysis needed	Further analysis needed
Intersections	Capital Improvements	\$0	\$2.1 - \$10.5
Bridge	Structures	\$15.6	\$82.6

Based on existing transportation revenue sources, the County has approximately \$23 million in available funds today and will accrue another \$529 million in funds by 2040.

What is the County doing to generate more revenue for transportation?

Goals identified through the planning process for implementation include:

- A. *Identify a methodology for prioritizing projects which emphasizes the importance of maintaining the existing roadway system.*
- B. *Consider consistency with the Larimer County Master Plan as an element of project prioritization for roadway maintenance and improvement.*
- C. *Identify methods to share costs with adjacent cities and other governmental entities.*
- D. *Consider identifying dedicated funding for alternative transportation modes.*
- E. *Update the Transportation Capital Improvement Program on an annual basis.*

The County recently released a Capital Improvement Plan, which is the foundation for an implementation plan over the next five years. The County is also conducting a Transportation Funding Study to identify ways to address the funding shortfall. This study will:

- Evaluate existing funding sources
- Project available funding given current conditions
- Review peer county revenue streams and transportation expenditures
- Identify and summarize additional potential funding opportunities
- Create a decision-making matrix to establish plan for funding projects by type